Valuing marine ecosystem benefits to inform policy and management approaches and provide evidence for the designation of protected areas

This report combines the Impact Assessments created by Defra to inform the designation of Marine Conservation Zones (MCZ) in all 3 phases of the designation process. The document provides corroboration of the impact of PML research in the MPA planning process.

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Title: Designation of Marine Conservation Zones in English inshore waters and English and Welsh offshore waters

IA No: Defra 1475

Lead department or agency: Department For Environment, Food and Rural Affairs

Other departments or agencies:

Impact Assessment (IA)

Date: 23/08/2013

Stage: Final

Source of intervention: Domestic

Type of measure: Secondary legislation

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02072386331

Summary: Intervention and Options

RPC Opinion: GREEN

What is the problem under consideration? Why is government intervention necessary?
A biologically diverse marine environment is of high value to society. Market failure occurs because no monetary price is attached to many goods and services provided by the marine environment so market mechanisms cannot ensure that actions are fully paid for. This results in negative externalities as damage to the marine environment is not fully accounted for by users. Also, marine environmental goods and services are ‘public goods’ (in that no one can be excluded from benefiting from them). In such a case, individuals do not have an economic incentive to voluntarily contribute effort or money to ensure their continued existence.

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 this strategy, helping meet the UK’s commitments to national, European and international agreements. Marine Conservation Zones (MCZs - a type of MPA) are an essential component of this and Government has a duty to designate MCZs under the Marine and Coastal Access Act 2009 (MCCA). The designation of MCZs will help to deliver the Government's aim of a well-managed network of MPAs that is understood and supported by stakeholders.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)
Preferred option is to designate a first tranche of 28 MCZs in 2013 where designation decisions are made using the best available evidence, ensuring we have 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.
The MCZs not included in the 2013 tranche are considered to be unsuitable for immediate designation due to a number of factors (see section 4 Consultation background).
Option 0 or the “do nothing option” is not a viable policy option in this instance because section 123 of the MCAA places a legal obligation on Government to create a network of marine protected areas which includes MCZs.

Will the policy be reviewed? If applicable, set review date: Month/Year

Does implementation go beyond minimum EU requirements? Yes / No / N/A

Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.

Micro Yes Yes Small Medium Large
< 20 Yes Yes Yes Yes

What is the CO₂ equivalent change in greenhouse gas emissions? (Million tonnes CO₂ equivalent)
Traded: Non-traded:

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

George Eustice

Date: 30/10/2013
**Summary: Analysis & Evidence**

**Policy Option 1**

**Description:**

FULL ECONOMIC ASSESSMENT

<table>
<thead>
<tr>
<th>Price Base Year 2010</th>
<th>PV Base Year 2013</th>
<th>Time Period Years 20</th>
<th>Net Benefit (Present Value (PV)) (£m)</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Low: -£25.9m</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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**COSTS (£m)**

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<th>Total Cost (Present Value)</th>
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<td>25.9</td>
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<tr>
<td>High</td>
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<tr>
<td>Best Estimate</td>
<td>27.3</td>
<td>0.9</td>
<td>32.7</td>
</tr>
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</table>

**Description and scale of key monetised costs by ‘main affected groups’**

Best estimate average annual costs (including transition): renewable energy (£0.09m/yr); ports, harbours (£0.1m/yr); commercial fisheries (£0.25m/yr); aggregate extraction (£0.02m/yr); cables (£0.002m/yr); flood & coastal erosion (£0.001m/yr); national defence (£0.008m/yr); oil and gas (£0.05m/yr); public sector management (£0.59m/yr) and ecological surveys (£1.1m/yr).

**Other key non-monetised costs by ‘main affected groups’**

Sectors where future projects were highly uncertain costs have not been quantified (see section 6). There are potential 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.

**BENEFITS (£m)**

<table>
<thead>
<tr>
<th></th>
<th>Total Transition (Constant Price)</th>
<th>Average Annual (excl. Transition) (Constant Price)</th>
<th>Total Benefit (Present Value)</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>Best Estimate</td>
<td>Optional</td>
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</tbody>
</table>

**Description and scale of key monetised benefits by ‘main affected groups’**

A number of the expected recreational benefits of MCZs have been monetised for illustrative purposes within this IA. Due to uncertainty concerning the scale of benefits calculated, they have not been included in the summary sheets.

**Other key non-monetised benefits by ‘main affected groups’**

A combined area of approximately 10,100km2 will be protected by designation of MCZs and over 165 features, which is 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) and cultural (and recreational) services. An overall network of marine protected areas is likely to have additional benefits such as an increase in biological resilience to adapt to changed conditions.

**Key assumptions/sensitivities/risks**

Discount rate (%) 3.5

Following site designation 75% of affected fishing effort (landings value /GVA) assumed displaced and 25% lost (assumption tested at consultation). Uncertainty around application costs to future developments from MCZ designation (IA uses various sensitivity scenarios to provide high/ low estimates where possible). Mitigation of licensing activities impact on broad scale habitats protected by MCZs is negligible due to small footprint of the activities compared to the overall area protected.

**BUSINESS ASSESSMENT (Option 1)**

<table>
<thead>
<tr>
<th>Direct impact on business (Equivalent Annual) £m:</th>
<th>In scope of OITO?</th>
<th>Measure qualifies as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs: 0.5</td>
<td>Yes</td>
<td>IN</td>
</tr>
<tr>
<td>Benefits: 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 the Environment, Food and Rural Affairs
EA – Environment Agency
EANCB – Estimated Annual Net Cost to Business
EH – English Heritage
EIA – Environmental Impact Assessment
EMS – European Marine Site
ENG – Ecological Network Guidance
EU – European Union
FCERM – Flood and Coastal Erosion Risk Management
FOCI – Feature of Conservation Importance (including HOCI and SOCI)
FS- Finding Sanctuary Conservation Zones Project
GVA - Gross Value Added
HOCl – Habitat of Conservation Importance
IA – Impact Assessment
IFCA - Inshore Fisheries and Conservation Authority
ISCZ - Irish Sea Conservation Zones
JNCC - Joint Nature Conservation Committee
MCAA – Marine and Coastal Access Act
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
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
rMCZ – Recommended Marine Conservation Zone (from the Regional Project process)
SAC - Special Areas of Conservation (SAC)
SAP – Science Advisory Panel
SNCB – Statutory Nature Conservation Body
SOCI – Species of Conservation Importance
SPA - Special Protection Areas (SPA)
SSSIs - Sites of Special Scientific Interests
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

1 Sites designated as Wetlands of International Importance under the Ramsar Convention (1971).
4 Designated under the Wildlife and Countryside Act 1981 (as amended).
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 developing 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), Special Areas of Conservation (SACs), RAMSAR sites, Sites of Special Scientific Interest (SSSIs), and a new type of MPA, Marine Conservation Zones (MCZs, see Box 1), created under Part 5 of the Marine and Coastal Access Act 2009 in England and Wales.

1.3 MCZs will protect areas that are nationally representative and important to conserve for the diversity of nationally rare or threatened habitats and species they contain. Unlike other types of MPA, designation of MCZs will involve taking social and economic factors into account alongside environmental factors when identifying potential sites.

1.4 Department for the 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.

1.5 In England, Defra invited the Statutory Nature Conservation Bodies (SNCBs), Natural England (NE) and the Joint Nature Conservation Committee (JNCC), to make recommendations for locations for MCZs which had stakeholder support. To do this SNCBs established four regional stakeholder led projects (each of which chose its own name) covering the English North Sea (‘Net Gain’), Irish Sea (‘Irish Sea Conservation Zones’), South-East (‘Balanced Seas’) and South-West (‘Finding Sanctuary’). This approach to open policy making not only allowed a diverse range of stakeholders to shape marine conservation; it also enabled social and economic considerations to be taken into account when sites were selected by the regional project stakeholder groups as recommended MCZs.

1.6 The SNCBs provided the Regional MCZ Projects with guidance on the criteria for selecting a network of MCZs, based on the OSPAR network design principles in their regions (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. Defra also established an independent expert Marine Protected Areas Science Advisory Panel (SAP) to support the regional project process.

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7 Sites designated as Wetlands of International Importance under the Ramsar Convention (1971).
8 Designated under the Wildlife and Countryside Act 1981 (as amended).
9 Oslo and Paris Commission (Ospar) Guidance on Developing an Ecologically Coherent Network of Ospar Marine Protected Areas, (Reference number 2006-3)
1.7 The Regional MCZ Projects made their recommendation for 173 MCZs in 127 locations (108 MCZs, 46 reference areas (RAs)\textsuperscript{10} within MCZs and 19 standalone reference areas) in September 2011. These were reviewed by the SAP which, while recognising that the recommendations had come from a stakeholder-led process, raised significant concerns about the state of the evidence base supporting the recommendations. As a result of these concerns, former Environment Minister Richard Benyon made a Written Ministerial Statement in November 2011 announcing that MCZ designations would be made in tranches with the best-evidenced sites designated first, revising the timetable for designation and announcing additional funding to support further evidence gathering. Formal advice to Ministers on site designation was also provided by SNCBs. This was presented to Defra in July 2012 alongside the IA from the regional projects.

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

**MCZs** are a type of Marine Protected Area (MPA). They will protect areas that are nationally representative and important to conserve for the diversity of nationally rare or threatened habitats or species they contain. The features\textsuperscript{11} listed for designation will ensure the range of marine biodiversity in the UK's seas is conserved. Unlike other MPAs, designation of MCZs took into account social and economic factors when identifying potential sites, alongside the best available scientific evidence.

For assessment in the IA, the social and economic impact of designating MCZs is assessed based on the conservation objectives.

Conservation objectives\textsuperscript{12} define the change in feature condition being targeted, and hence have implications for the management of human activities that may impact on that feature:

Features with a conservation objective direction of travel 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. A feature attains favourable condition when its extent or population is stable or increasing, it has the structure and functions (or habitat) that are necessary for its long-term maintenance, and the quality and occurrence of habitats and the composition and abundance of species are in line with prevailing natural conditions (Natural England and JNCC, 2011).

Features with a conservation objective direction of travel 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 (with the associated costs and benefits).

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\textsuperscript{10} Highly protected MCZs where all extraction, deposition or human-derived disturbance is removed or prevented to enable features to achieve reference condition (a state where there are no, or only very minor, changes to the values of environmental elements which would be found in the absence of anthropogenic disturbance)

\textsuperscript{11} 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).

\textsuperscript{12} A Conservation Objective is a statement of the action need to achieve the desired ecological/geological state of a feature for which an MCZ is designated.
2. Problem under consideration and the rationale for government intervention

2.1 A biologically diverse marine environment is of high value to society through the services that it provides and as a basis for human health and livelihoods (OSPAR, 2010). Fish landings and aquaculture from the marine environment have a market value, while non-traded services include education, flood control, recreation and research. Aside from its economic value to society, the natural environment has intrinsic or ‘non-use’ value.13

2.2 Human activities are having a detrimental effect on the extent and condition of many diverse habitats and their ecosystems, ranging from sediment, rock and reef to maerl beds and some endangered habitats such as deep sea cold water corals (OSPAR, 2010). Fishing affects large areas of the sea bed (the UK Marine Monitoring and Assessment Strategy -UKMMAS, 2010) and has large impacts on marine ecosystems (OSPAR, 2010). Pressures exerted by other activities including aggregate extraction, coastal defence, shipping and wind farms are increasing. OSPAR14 (2010) noted that ‘a reduction in the decline in biodiversity is still a long way off’, and that combined pressures from human activities are not fully understood and need to be carefully managed to avoid undesirable impacts. 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 (JNCC, 2010).

2.3 The reduction in extent and condition of marine habitats and ecosystems is due to market failures and public good characteristics, hence the need for government intervention 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.15 In the context of the marine environment these failures 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 not necessarily have an economic incentive to voluntarily contribute effort or money to ensure the continued existence of these goods (HM Government, 2011a) 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.

2.4 Government intervention is required to redress both these sources of market failure in the marine environment. Designation of Marine Conservation Zones 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.

13 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’.

14 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.

3. Policy objective and intended effects

3.1 The UK Government and Devolved Administrations’ vision for the marine environment is for ‘clean, healthy, safe, productive and biologically diverse oceans and seas’ (HM Government, 2011b). This vision recognises the economic, social and intrinsic value of a healthy marine environment and demonstrates a commitment to halting the loss of biodiversity and restoring it as far as is feasible (HM Government, 2011b).

3.2 The UK administrations have committed to completing 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 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. 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.

3.3 This network will be a key tool in contributing to achieving Good Environmental Status as required by the Marine Strategy Framework Directive (MSFD) and particularly in ensuring that biodiversity and seafloor ecosystems are protected, conserved and where appropriate recovered. The UK has also made a number of international commitments including delivering a contribution to the ecologically coherent network of MPAs under OSPAR, and to ‘establish a representative network of MPAs’ as set out in the World Summit on Sustainable Development (2002); and the Convention of Biological Diversity.

3.4 The network provided for in the Marine and Coastal Access Act (MCAA) and the MCZs in ‘English’ waters will contribute to meeting these national and international commitments. Designation of MPAs 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.

3.5 Management measures for MCZs will be set by the regulatory authorities after designation and be determined by what is required to meet a site’s conservation objectives. Since these measures are not known in advance, this IA contains illustrative examples – including the best estimate – of likely management scenarios and their costs. There are likely to be a range of management measures across and within MCZs, delivering differing levels of protection depending upon the sensitivity of the species, habitats and geological feature (for which a site is designated) to the activities taking place in that area and on the conservation objectives for those features.

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16 UK Marine Policy Statement
17 English inshore and English and Welsh offshore waters
4. Consultation background

4.1 The Marine Conservation Zones Public Consultation was published on the 13th December 2012 (Impact Assessment Defra 147518). This IA 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 the consultees to compare the two options available to Government against a baseline of no MCZs.

4.2 The 31 sites of preferred Policy Option 2 were chosen using the best available evidence, ensuring 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.

4.3 The MCZs not included in the 2013 tranche are considered to be unsuitable for immediate designation due to:
   - Lack of certainty on presence, extent and condition of features – features (or sites) were excluded where there was not sufficient scientific certainty,
   - Uncertainty of economic impacts – the preferred option excluded sites with the potential for high unquantified costs,
   - Lower ecological benefits compared to higher costs,
   - Scientific advice on reference areas.

4.4 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. Greater ecological contribution was required for sites with higher socio-economic costs. MCZs in the top quartile were considered suitable for inclusion in the network only if they provided an opportunity to protect a feature where there are limited opportunities to protect it nationally; or it is the best example of the feature nationally; or included multiple features where there are limited opportunities to protect them regionally; and/or they are the best examples of the features regionally.

4.5 The consultation was used to test support and gather additional information, through the following nine questions mentioned in the box below. 40,632 responses were recorded, with around 95% in support of MCZs. The Government response to the consultation illustrates the breakdown of responses from sectors and organisations, as well as an overview of the main concerns raised.

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4.6 As a result of the consultation responses:

- Scientific and socioeconomic information and assumptions were amended due to additional information being submitted during the consultation and the evidence base strengthened through survey work. This has fed into the final selection process. Detail of changes to assumptions and costs are set out in section 6.8 to 6.35; detail of changes to benefits are explained in para 7.19.

- A total of 3 sites are not being taken forward from the 2013 site designation proposals (Hilbre Island Group, Stour & Orwell and North of Celtic Deeps were removed with Hythe Bay being deferred for further consideration) due to changes in the social and economic and/or scientific basis for which they were first recommended or due to consideration of responses to the consultation.

- Hilbre Island Group was excluded due to the minimal conservation value the site provided. Of the two features recommended, one is currently protected by an existing Special Area of Conservation (SAC)\(^\text{19}\), the other a poor example of the feature which does not warrant the level of protection that would be provided in an MCZ.

- Significant concerns were raised regarding the socio-economic impact at Stour & Orwell. Amending the site boundaries to exclude port harbour authority limits reduced the ecological integrity of this site, and with no other viable option available the site was dropped.

- North of Celtic Deeps site proposal is not being taken forward from the 2013 site designation proposals at the specific request of the Welsh Assembly Government whilst they consider further their contribution to the network. A decision on this site will be taken once the Welsh Government has concluded their considerations.

- A decision on Hythe Bay designation has been deferred until early 2014 to allow for further discussions to explore possible solutions with local fishing interests, Natural England and the local Inshore Fisheries Conservation Authority (IFCA) with the aim of delivering the conservation aims for the site and taking account of local fishing interests. Hythe Bay is included within the total number of sites considered in this IA, due to possible designation shortly after the 2013 tranche.

\(^{19}\) SACs are designated under the EU Habitats Directive
5. **Overview of baseline option**

5.1 Baseline (option 0) or the “do nothing option” is not a viable policy option in this instance because Section 123 of the MCAA places a legal obligation on Government to create a network of marine protected areas. As such, the ‘do nothing option’ simply provides the baseline against which costs and benefits of MCZs are calculated (in line with IA guidance). The baseline encompasses all current protection and legislation, including the features already recognised under European Union (EU) or national lists, as illustrated in Figure 1 below. This shows that the effect of the activity (red triangle) on some of the features (Features of conservation importance (FOCI)) is already accounted for as these are already protected under existing legislation thus MCZ designation does not create additional costs. Figure 2 (discussed in para 6.4) states what type of additional features protected under MCZ designation are likely to lead to additional costs to activities.

![Figure 1: Illustrative MCZ and features under baseline](image_url)

**Activity (example – oil and gas development)**

**Licensing costs:** All FOCI are already considered in licence applications. Assessments of Environmental Impact must consider these.

**Mitigation costs:** FOCI are already considered in licence applications (i.e. just for licensed activities). A proposed development or activity may have a significant footprint on a FOCI and mitigation is required.

5.2 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. Location-specific information on the condition of features in the proposed MCZs is not currently available in all locations. Using knowledge of feature location and of activities that are occurring in that location, Vulnerability Assessments were carried out to assess whether each feature in each MCZ is likely to be in favourable or unfavourable condition. Features assessed to be in favourable condition are given a ‘maintain’ conservation objective while those assessed to be in unfavourable condition are given a ‘recover’ conservation objective.

5.3 We do not have location-specific information on the trend in feature condition 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

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20 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).

21 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.
favourable or unfavourable condition in the absence of MCZ designation i.e. under baseline conditions. 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. There is a risk that this assumption is incorrect however we do not have information on the likelihood of this risk and so quantified benefits and costs of designation are assessed relative to the baseline of constant feature condition.

5.4 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 action may not be taken to keep this at the current level. 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. At a UK-wide scale, there may also be increased pressures on the marine environment from climate change. Whilst there is a 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.

5.5 Activities in or near proposed MCZs were assessed in detail as part of the Regional Project process. 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. This information was updated with any additional information in response to the public consultation. All amendments to assumptions and costs from the consultation are highlighted in section 6 below. Please see Table 4 below for full assumptions.

5.6 As a result of the consultation results outlined in para 4.3, the following MCZs will be designated in 2013:

<table>
<thead>
<tr>
<th>Finding Sanctuary</th>
<th>Balanced Seas</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Canyons 3.1</td>
<td>Blackwater, Crouch, Roach and Colne Estuaries MCZ 3</td>
</tr>
<tr>
<td>Southwest Deeps (West) 3.2</td>
<td>Medway Estuary MCZ 6</td>
</tr>
<tr>
<td>East of Haig Fras 3.7</td>
<td>Thanet Coast MCZ 7</td>
</tr>
<tr>
<td>Poole Rocks 3.14</td>
<td>Folkestone Pomerania MCZ 11.4</td>
</tr>
<tr>
<td>South Dorset 3.16</td>
<td>Beachy Head West MCZ 13.2</td>
</tr>
<tr>
<td>Chesil Beach and Stennis Ledges 3.19</td>
<td>Kingmere MCZ 16</td>
</tr>
<tr>
<td>Torbay 3.22</td>
<td>Pagham Harbour MCZ 25.1</td>
</tr>
<tr>
<td>Skerries Bank and Surrounds 3.24</td>
<td></td>
</tr>
<tr>
<td>Tamar Estuary Sites 3.27</td>
<td>* Hythe Bay deferred for further consideration</td>
</tr>
<tr>
<td>Whitsand and Looe Bay 3.28</td>
<td></td>
</tr>
<tr>
<td>Upper Fowey and Pont Pill 3.29</td>
<td></td>
</tr>
<tr>
<td>The Manicles 3.32</td>
<td></td>
</tr>
<tr>
<td>Isles of Scilly 3.35</td>
<td></td>
</tr>
<tr>
<td>Padstow Bay and Surrounds 3.38</td>
<td></td>
</tr>
<tr>
<td>Lundy 3.41</td>
<td></td>
</tr>
<tr>
<td>Irish Seas Conservation Zones</td>
<td>Net Gain</td>
</tr>
<tr>
<td>Fylde Offshore MCZ 8</td>
<td>Ain Estuary NG 13a</td>
</tr>
<tr>
<td>Cumbria Coast MCZ 11</td>
<td>Rock Unique NG 15</td>
</tr>
<tr>
<td></td>
<td>Swallow Sand NG 16</td>
</tr>
</tbody>
</table>

Note: In England Defra invited the Statutory Nature Conservation Bodies (SNCBs), Natural England and the Joint Nature Conservation Committee (JNCC), to make recommendations for locations for MCZs which had stakeholder support. To do this SNCBs established four regional projects (each of which chose its own name) covering the English North Sea ('Net Gain'), Irish Sea ('Irish Sea Conservation Zones'), South-East ('Balanced Seas') and South-West ('Finding Sanctuary'). This approach to open policy making not only allowed a diverse range of stakeholders to shape marine conservation; it also enabled socio-economic considerations to be taken in to account when sites were selected as recommended MCZs.

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22 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.

23 Threats to marine ecosystems as a result of climate change are described in OSPAR (2010)

24 http://publications.naturalengland.org.uk/publication/1921610
6. Costs under the baseline and preferred option

Costs under the baseline scenario

6.1 The baseline includes a number of costs relating to existing marine protection / regulation in these areas. These are not costs attributed to the designation of MCZs because they are already incurred. They include:

- 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, and upon requirements to meet the existing Water Framework Directive and Marine Strategy Framework Directive. Costs for Environmental impact assessments (EIAs) vary depending on project size - a study of 18 EU examples found EIA costs to range from 0.01% to 2.56% of the total development cost with the average being 0.5%.

- Mitigation actions. Where a development / action may have an adverse impact on these listed features, licensed industry has to take actions to mitigate these impacts. (e.g., amending location, adding cushioning for cables, etc).

- Costs to fisheries. Commercial fisheries may incur costs in the baseline due to existing closed areas, quota, effort and gear restrictions.

- Public sector costs - monitoring of vessels, catches and species stocks; management of existing licence applications and protected areas.

Table 2: Summary of baseline costs to private industry and public bodies. Note: all acronyms are explained on page 1 of the evidence base.

<table>
<thead>
<tr>
<th>Impacted Private Sector</th>
<th>Description of baseline costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate extraction</td>
<td>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 these features.</td>
</tr>
<tr>
<td>Cables</td>
<td>Licence application costs, including assessment of environmental impact on features of conservation importance (FOCI). Industry undertakes this voluntarily in areas outside of 12nm. Mitigation activities may be required for some features protected under existing lists, such as frond mattressing.</td>
</tr>
<tr>
<td>Coastal development</td>
<td>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.</td>
</tr>
<tr>
<td>Commercial Fisheries</td>
<td>Common Fisheries Policy (CFP) e.g. Limits on commercial fishing of quota stocks. UK fisheries management e.g. IFCA byelaws on vessel size Conservation e.g. Management of fishing in MPAs e.g. European Marine Sites (EMS) Voluntary codes of conduct.</td>
</tr>
<tr>
<td>Flood and coastal erosion risk management</td>
<td>Licence application costs, including costs of assessment of environmental impact to consider impact on FOCI. Mitigation (such as moving planned location or restrictions on construction activities) may be required to avoid damage to these features.</td>
</tr>
<tr>
<td>Historic Environment</td>
<td>Current costs for licence applications, including licence applications for archaeological activities on Historic Protected Wrecks. Depending on the scale and type of activity, the MMO or Natural England 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 conduct in</td>
</tr>
</tbody>
</table>

25 Note that, consistent with Impact Assessment guidance, we assume that these previous policies have been effectively implemented.
26 Costs in excess of 1% of capital costs were the exception, and occurred in relation to particularly controversial projects in sensitive environments, or where good EIA practice had not been followed. From ‘EIA: a study on costs and benefits’ [link](http://ec.europa.eu/environment/eia/eia-studies-and-reports/eia-costs-benefit-en.htm)
place to protect any sensitive features such as archaeological sites or seagrass beds.

<table>
<thead>
<tr>
<th>Oil &amp; Gas</th>
<th>Licence application costs, including costs of assessment of environmental impact to consider impact on FOCI. Mitigation activities (such as pipeline routes, chemical release), may be required to avoid damage to these listed features, in the absence of MCZ designation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports, harbours, Commercial shipping and disposal sites</td>
<td>Licence application costs, including costs of EIA to consider impact on FOCI. 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/development/expansion.</td>
</tr>
<tr>
<td>Recreation</td>
<td>Management and best practice advice in relation to potentially damaging activities such as anchoring and wildlife watching. Specific management of activities in MPAs.</td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>Licence application costs, including costs of EIA to consider impact on FOCI. Mitigation (such as adjusting planned cable routes, using different turbine foundations, seasonal restrictions on activity), may be required to avoid damage to these features.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impacted Public Sector</th>
<th>Description of baseline costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Defence</td>
<td>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.</td>
</tr>
<tr>
<td>Costs to public sector for marine management</td>
<td>Costs to MMO, IFCAs to monitor existing protected features and sites, enforce requirements of Common Fisheries Policy (CFP)(^\text{27}) and administration of the marine licensing process.</td>
</tr>
<tr>
<td>Ecological Surveys</td>
<td>SAC and SSSI monitoring; biodiversity monitoring to meet existing requirements under EU legislation.</td>
</tr>
</tbody>
</table>

Stakeholder engagement process for MCZ designation

6.2 Box 3 below provides information on stakeholder engagement process for the MCZ designation. 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 informed the identification of management scenarios and identification of possible and preferred management measures. The regional MCZ projects invited the regional stakeholder groups to comment on the management scenarios and management measures, and to make further suggestions. As part of the Regional Project process, method papers were developed with input from stakeholders for each sector \(^\text{28}\). These methodologies were also independently peer reviewed by academic experts.

<table>
<thead>
<tr>
<th>Box 3: The stakeholder engagement process followed to identify management scenarios and industry costs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>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. (^\text{29}).</td>
</tr>
<tr>
<td>2) The management scenarios used in the IA were also informed by advice provided by JNCC and Natural England on the mitigation that is likely to be needed. This advice did not pre-judge the advice that JNCC and Natural England will provide (as statutory nature conservation advisers) for specific licence applications or for any future site-specific licensing decision. In collaboration with the relevant regulators, Natural England 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.</td>
</tr>
<tr>
<td>3) Specialists in JNCC and Natural England 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. JNCC and Natural England also continued discussions with developers for some specific sites to try to alleviate their concerns e.g. Atlantic Array and the Potential Co-location Zone.</td>
</tr>
<tr>
<td>4) Economists in the regional MCZ projects collaboratively developed draft management scenarios that reflected the mitigation that was likely to be needed, based on the information provided in (1) and (2) above. Feedback on these was sought from Defra, the independent academic peer reviewers appointed by Defra, specialists in JNCC and Natural England and representatives of the sectors concerned. At the same time, the regional MCZ project economists also sought information on the likely costs of the scenarios from representatives of the different sectors.</td>
</tr>
<tr>
<td>5) In providing feedback on the draft management scenarios, representatives of some sectors raised concerns that the scenarios under-estimated the costs of mitigation that will be required. To address the concern, a high cost management scenario was added to the IA for renewable energy to capture some of the concerns raised by developers. JNCC and Natural England advised that this scenario was very unlikely to arise and to reflect this the regional MCZ projects attributed a low probability to this scenario when calculating the best estimate. A high cost management scenario for ports and harbours was added to the IA to take account of some of the concerns raised by industry representatives. Based on advice from Natural England, the best estimate was calculated as being towards the upper end of the resultant range in costs. To incorporate some of the concerns about impacts on oil and gas extraction and production, sensitivity analysis was employed in the IA.</td>
</tr>
<tr>
<td>6) In addition, in order to ensure that the views of representatives of industry were captured in the IA, the regional MCZ project economists presented the representatives’ concerns (summarised in the evidence base and details provided in the documents in Annex H) and worked with industry to develop an ‘industry’ scenario. For three sectors ((1) renewable energy, (2) oil and gas exploration and production and carbon capture and storage, and (3) ports &amp; harbours only) these concerns involve costs that are substantially higher than the costs of the management scenarios employed in the IA. However, there was little evidence that such costs would be incurred – most were found to be existing costs and were not ‘additional’ costs. The consultation process was used to clarify their additionality.</td>
</tr>
<tr>
<td>7) For all scenarios, industry costs are used. It is the assumptions about management which differ which are appropriately informed by the SNCBs and regulator. 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 material, including cost estimates by government departments, JNCC, Natural England, stakeholder representatives on the regional MCZ project regional stakeholder groups, and independent experts in environmental economics appointed by Defra. The regional MCZ projects revised the material as appropriate to reflect feedback from the review. The consultation process will further test the estimates and the assumptions underpinning them.</td>
</tr>
</tbody>
</table>

\(^{28}\) These are available at [http://publications.naturalengland.org.uk/publication/2071071?category=1730361](http://publications.naturalengland.org.uk/publication/2071071?category=1730361)
6.3 The costs to designate 28 MCZs can be considered in the context of market failures in the marine environment discussed above paras 2.3 and 2.4. 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 [30], only additional costs and benefits due to MCZs are included – no costs which would have taken place in the absence of MCZs are included. Some features, not included for designation as an MCZ but are located inside the MCZ boundary, already have protection which is part of the baseline as discussed above (see figure 1). The costs and benefits relating to the protection of these features under current legislation are not included. The costs include only the costs flowing from the additional management which is required (and, as described below, the benefits include only the benefits flowing from the additional protection which is offered under MCZs – mainly broadscale habitats referred). Costs and benefits are only included in relation to features which will be designated in MCZs in 2013. If any further features in these MCZs are proposed for protection in the future, they will be subject to a separate Impact Assessment.

6.4 Impacts are assessed over a 20-year period. The costs and benefits from designation are long term in nature and hence a 20 year appraisal was considered appropriate (to suit 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 this impact assessment and engaged with stakeholders used a 20 year appraisal period meaning the same timeframe is required for consistency.

6.5 With regard to benefits, both studies used to inform this IA (RPA, 2013 & Kenter et al. 2013) also assess over a 20 year period. 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 large uncertainties, are better represented over a 20 year appraisal period and especially when compared to costs for the reasons described in 6.4.

6.6 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 2010 prices unless otherwise stated and projected values are given in constant prices. The present value of the costs and benefits has been calculated using a discount rate of 3.5% as per Treasury Green Book guidance.

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29 Information on the sensitivity of MCZ features to human activities was provided through research commissioned by Defra.

30 The regional MCZ projects then undertook vulnerability assessments that were informed by the research and other best available data.

6.7 The costs of preferred option can be split into 3 broad categories

1) **Activities where limited or no additional mitigation is required due to MCZs**, but there are additional costs of obtaining a license, for the assessment of environmental impact on BSH. This includes aggregate extraction, navigational dredging and disposal sites, 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.

In the low cost scenario, no additional mitigation is required for these sectors since the majority of MCZ features must already be considered in an assessment of environmental impact for license applications. The additional features, not already considered in licence applications, are mainly BSH. Based on current knowledge, offshore BSH tend to be larger and therefore the relative size of the footprint of any sector activities is likely to be low. This means that no changes to the **activity itself** or the location is likely to be necessary for these sites. However, the size of inshore BSH are more varied which means that the relative size of the footprint may be larger – this is very site specific and has been assessed on a case by case basis when relevant to do so. This means that, for some sites, another scenario is included which estimates potential costs of mitigation was required for these BSH. This is described below.

2) **Activity where management will be necessary**: The main sectors which will have to change their activities due to designation of MCZs are fisheries and recreation, since other sectors are already required to mitigate impact on MCZ features of conservation protected on BAP, OSPAR and Wildlife and Countryside Act (WCA) lists, explained below. Management of activities for fisheries and recreation will be put in place by the regulatory authorities after designation. 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 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. Management measures will be drawn up separately and put in place once sites are formally designated, 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. A range of costs is given to account for uncertainty and a best estimate is given. Site-specific scenarios for management and the resulting costs are described in Table 3, Table 4 and Annex A (latter provides the fisheries management scenarios).

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31 Each management option will consider all alternatives to regulation through local discussion. 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.
As described above, for sectors beyond fisheries and recreation some mitigation may be required, which has been assessed on a case-by-case-basis. In situations where the low probably, high cost, scenario does occur and results in mitigation costs that are prohibitively expensive (relevant for all licence applications), the MCAA (2009) Public Benefit Test will apply\(^3\) – that is, the MMO will determine whether the benefit to the public of proceeding with the proposed development clearly outweighs the risk of damage to the environment that will be created by proceeding with it\(^3\). To be clear, this means that if the cost to society (from not proceeding with the licensed activity) outweighs the ecological cost (of proceeding with the activity measured in terms of market failures), it is unlikely that the activity will be restricted.

3) **Public sector costs** – There are potential costs to the Environment Agency (EA), for additional monitoring relating to Flood and Coastal erosion Risk Management (FCERM), and to the Ministry of Defence (MoD). In addition, there are costs to IFCAs, the MMO and other regulators for MCZ management, monitoring and enforcement, as well as the costs to Defra of ecological surveys. These are not included in the Estimated Annual Net Costs to Business (EANCB) figures.

6.8 The costs analysis in the IA has benefitted from an extensive consultation process for all 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. Accordingly costs are presented at differing levels of aggregation as follows:

- Table 3 provides a high level overview of the costs by sector of designating 28 sites
- Table 4 presents a detailed summary of the key assumptions, methodology, scenarios (high and low cost) and non-monetised costs for each sector.
- Changes to the costs following consultation are discussed in paragraphs 6.10 to 6.33
- Annex D presents detailed cost tables and calculations for the 20 year period covered by the IA. This includes the best, low and high cost estimates by business sector.

<table>
<thead>
<tr>
<th>Table 3: Summary of additional costs for designating 28 MCZs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full assumptions and the cost estimates for each sector are provided in Table 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impacted Sector</th>
<th>Best Estimate Cost £m/yr (low - high)</th>
<th>Best estimate PV Costs £m (low – high)</th>
<th>Description of Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate extraction</td>
<td>0.02m/yr (0.02-1.03)</td>
<td>0.25m (0.25 – 15.4)</td>
<td>Licence application costs, to collect more information on impact on designated features(^3). Mitigation required under high cost scenario for site Kingmere - a three-month closure of marine aggregate extraction during the Black bream nesting period in the MCZ. Additional costs to British Marine Aggregate Producers Association (BMAPA).</td>
</tr>
<tr>
<td>Aquaculture</td>
<td>0.006 (0-0.02)</td>
<td>0.09m (0 – 0.35)</td>
<td>Cost of MCZ under high cost scenario is based on ‘compulsory use of triploid stock’ and all pacific oyster production stops. The best estimate is 25(^{th}) Percentile of high cost scenario as risk of implementing high cost scenario is low.</td>
</tr>
</tbody>
</table>

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\(^{32}\) See s.126(7)(b) and (c) and the MMO’s assessment process for MCZ licence applications- [http://www.marinemanagement.org.uk/licensing/documents/guidance/13.pdf](http://www.marinemanagement.org.uk/licensing/documents/guidance/13.pdf)

\(^{33}\) and, if so, the applicant can satisfy the MMO that they will undertake or make arrangements for the undertaking of measures of equivalent environmental benefit to the damage which the act will or is likely to have in or on the MCZ. To weigh up societal and ecological costs, the MMO will use information supplied by the applicant with the licence application, advice from the SNCBs, other Government Departments, Local Authorities, Local Enterprise Partnership, the Marine and Coastguard Agency and others where appropriate.

\(^{34}\) Considering impacts on BAP and OSPAR features as well as broadscale habitats in licence application since the BMAPAs new BAP process has come about as a result of the MCZ process, see Annex H2 for further explanation.
<table>
<thead>
<tr>
<th>Sector</th>
<th>Monetised Costs</th>
<th>Non-monetised Costs</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cables</strong></td>
<td>0.002m/yr</td>
<td>0.03 (0.01-0.04)</td>
<td>Licence application costs for future developments, to collect more information of impact on BSH. Mitigation costs are very unlikely, since the footprint of cables is anticipated to be small compared to the extent of BSH, especially in offshore sites.</td>
</tr>
<tr>
<td><strong>Coastal Development</strong></td>
<td>Non-monetised</td>
<td>Non-monetised</td>
<td>Additional un-monetised costs although unlikely for MCZs in Blackwater, Crouch, Roach and Colne Estuaries, Medway Estuary and Cumbria coast, detailed in table 4.</td>
</tr>
<tr>
<td><strong>Commercial Fisheries</strong></td>
<td>0.25m/yr</td>
<td>3.7m (0.07m-37.7m)</td>
<td>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, discussed below. These are calculated as loss in Gross Value Added (GVA), as for all sectors. High scenario includes sensitivity of loss of all affected fishing GVA.</td>
</tr>
<tr>
<td><strong>Historic Environment</strong></td>
<td>Not possible to monetise</td>
<td>Not possible to monetise</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Oil &amp; Gas</strong></td>
<td>0.05 (0.04-0.07)</td>
<td>0.83 (0.6 - 1.07)</td>
<td>License 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 &amp; 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.</td>
</tr>
<tr>
<td><strong>Ports, harbours, Commercial shipping and disposal sites</strong></td>
<td>0.1m/yr (0.04 – 0.1)</td>
<td>2m (0.6 – 2.05)</td>
<td>Licence application costs for future applications to collect more information of impact on BSH. Some mitigation of activities is required on a site-by-site basis, including dredging, disposal at sea, maintenance, described in table 4. It is only possible to monetise costs where development plans are known. Unknown potential future costs have been minimised by changing MCZ boundaries to exclude costs where possible.</td>
</tr>
<tr>
<td><strong>Recreation</strong></td>
<td>No monetised costs</td>
<td>No monetised costs</td>
<td>Likely to be costs to sector arising from managing potential pressure (on subtidal mud) from increased anchoring outside the harbour area in MCZ site Torbay. Impacts have not been quantified due to uncertainty on the management required. Please see para 6.27.</td>
</tr>
<tr>
<td><strong>Renewable</strong></td>
<td>0.09</td>
<td>1.4m</td>
<td>Licence application costs for future Development and Disposal Sites...</td>
</tr>
</tbody>
</table>

35. As only two inshore sites have been dropped (Hilbre Island and Stour and Orwell) the changes in costs due to scaling down is very minor and not reflected in the estimates presented.
36. Gross value added, i.e. revenue minus costs associated with the activity.
37. During consultation errors were spotted during calculation of estimates which have been amended in this version. This has resulted in a minor change in costs.
38. This has taken place for Beachy Head West, as well as Padstow Bay and Surrounds.
developments, to collect more information specifically of impact on BSH. An unlikely high cost scenario describes additional mitigation of giving cables alternative methods of protection. As above, mitigation costs for future developments are very unlikely, since the footprint of renewable development 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, this remains an unlikely un-monetised cost.

| Total annual and PV costs to private sector | 0.5m/yr | 8.3m (1.6 – 65.5) PV 2013 base year; 2010 prices | EANCB figure**
Best estimate figure is used for the EANCB (converted to 2009 prices and 2010 base year). These only reflect the costs as the benefits have not been monetised.

<table>
<thead>
<tr>
<th>Impacted Public Sector</th>
<th>Cost £m/yr (low-high)</th>
<th>PV cost £m (low-high)</th>
<th>Description of Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment Agency (for FCERM)</td>
<td>0.001m/yr</td>
<td>0.01m</td>
<td>Licence application costs to Environment Agency for any future developments – additional costs to consider impact on broadscale habitats; plus one off cost for additional monitoring in Beachy Head West.</td>
</tr>
<tr>
<td>National Defence</td>
<td>0.008m/yr**</td>
<td>0.12m</td>
<td>Costs of adjusting electronic tools and charts and annual costs of maintaining; Additional planning considerations</td>
</tr>
<tr>
<td>Costs to public sector of managing MCZs</td>
<td>0.59m/yr (0.58 - 0.6)</td>
<td>8.7m (8.6 - 8.8)</td>
<td>Costs to MMO, IFCAs and Defra for enforcing management measures.</td>
</tr>
<tr>
<td>Ecological Surveys</td>
<td>1.1m/yr (1.1 -1.9)</td>
<td>15.6m</td>
<td>(15.6 -28.2)</td>
</tr>
</tbody>
</table>

** Annual and PV costs to public sector | 1.7m/yr | 24.4m | (24.3 – 37.1) |

| Overall annual and PV costs | 2.2m/yr (1.8 -7) | 32.7m (25.9 - 102.6) | Annualised total costs for public and private sector |

Notes:
- Costs unchanged from consultation unless specified.
- The annual costs (m/yr) for each sectors (including public costs) are total costs (transition plus annual) averaged of the 20 year period (2013 to 2032), presented in 2010 prices. The EANCB figure of 0.5m/yr is calculated by converting the figures to 2009 prices and 2010 base year.

6.9 The difference in these costs from the consultation IA are summarised below, in paras 6.10 to 6.33.

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** Calculated on a calendar year basis, as per guidance.
40 Costs have been scaled down as fewer sites designated (28 vs 31) but this has had minimal impact on costs.
<table>
<thead>
<tr>
<th>Private Sector</th>
<th>Methodology, assumptions and sources</th>
<th>Best estimate scenario</th>
<th>Low / High cost scenarios</th>
<th>Non monetised costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate extraction</td>
<td>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). The additional cost to a license application is estimated to be £27k. <strong>Confidence:</strong> Costs provided by industry. BMAPA is content for scenario 1 to be used as the best estimate.</td>
<td>£0.02m/yr</td>
<td>£0.02m/yr - £1.03m/yr</td>
<td>Possible mitigation costs on future licence applications in new areas (strategic resource areas). Location of future licence application in relation to MCZs not known so not possible to assess distance in relation to MCZs.</td>
</tr>
<tr>
<td>Aquaculture</td>
<td>Aquaculture activity in and near each proposed MCZ mapped during the Regional Project Process.</td>
<td>£0.006m/yr</td>
<td>£0m/yr - £0.02m/yr</td>
<td>None</td>
</tr>
<tr>
<td>Cables</td>
<td>Existing cables and known future cable routes mapped.</td>
<td>£0.002m/yr</td>
<td>£0.001m/yr - £0.003m/yr</td>
<td>There are potential significant</td>
</tr>
</tbody>
</table>

1 These costs are additional to the baseline (i.e. attributable to MCZs) and represent full financial costs (includes wages, overheads and NI)  
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 on a regional basis 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 estimated to be £10K. Cost estimates provided by industry, at their discretion for inclusion of internal and external costs.

**Confidence**: UKCPC confirmed it is content with assumptions and provided cost estimates (pers. comm., 2011).

### Coastal Development
There are two known proposed coastal developments within 1km of two MCZs, the Bradwell Nuclear Power Station (Blackwater, Crouch, Roach and Colne Estuary MCZ) and a marine landing facility planned at the new nuclear power station development at Sellafield in Cumbrian Coast MCZ. There are no other known coastal developments planned in the vicinity of any other MCZ (except port and harbour developments below).

**No impact** anticipated on Sellafield's operations⁴. **Potential cost** to Bradwell Nuclear Power Station but subject to uncertainty as detailed proposals are not yet known.

**N/A**

Not possible to monetise as details of proposals not known in Blackwater, Crouch, Roach and Colne Estuary.

### Commercial Fisheries
Fishing activity in each MCZ from MCZ fisheries Model, see, Annex H7⁵. Value of Landing information provided in the consultation was verified and in some instances replaces modelled values. **Costs are due to management of some fishing activities.** Gear types affected and management required are specific to the site and the feature which the MCZ is designated to protect. Management scenarios for each MCZ are summarised in Annex A.

Costs are measured as loss in GVA i.e. the value of

<table>
<thead>
<tr>
<th></th>
<th>£0.25m/yr</th>
<th>£0.005m/yr - £2.6m/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best estimate for each gear type is either the mid-point or 25% of the range of management scenarios (detailed in Annex A). For gears which were a primary reason for unfavourable feature condition in an MCZ, the best estimate is the 50th percentile i.e. the mid-point of the range of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A range of management scenarios and displacement assumptions included: Scenario 1: Lowest potential management scenario. Assume 25% of value affected is lost. Scenario 2,3 etc: Highest potential management scenario, with no displacement of fishing to other areas, i.e. 100% of overlapping</td>
<td></td>
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</tbody>
</table>

**Social and economic impacts on local communities from effects on fisheries; indirect impacts to processors etc of any reduced catch.**

⁴ Based on the experience with the temporary landing facility that is already consented, Natural England feels that the permanent facility is unlikely to affect construction significantly and incur a significant cost (Natural England, pers. comm., 2011). This is because impact upon the MCZ features in the vicinity of the proposed facility are considered anyway. Therefore, MCZ 11 Cumbrian Coast will not impact on Sellafield’s operations.

² http://publications.naturalengland.org.uk/publication/1940011

³ 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.
landings associated with the relevant area of fishing grounds, minus costs associated with these landings. 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 updated for site Stour and Orwell where displacement was expected to be less but the site has been removed from 28 sites designated. **Confidence: Medium** Sites with high, uncertain costs to non-UK fleets have been excluded from this preferred option. Figures for displacement and fleet earnings have been updated with consultation responses.

**fishing GVA is lost**

<table>
<thead>
<tr>
<th>Historic Environment</th>
<th>Archaeological data sourced from numerous locations including consultation responses provided locations of currently designated sites and recorded finds. Mapped against MCZs. 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. Diver trails, visitors and non-intrusive surveys will be unaffected in MCZs. Vessels can no longer anchor over sensitive features such as seagrass beds</th>
<th>No impact possible to monetise. Only restrictions in this tranche are in MCZs with peat and clay beds as listed features and areas where vessel anchoring may be restricted (see column ‘non-monetised costs’)</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil &amp; Gas &amp; other energy (including carbon capture and storage (CCS) at sea)</td>
<td>Current activity mapped (including 26th and 27th Rounds) and potential future oil &amp; 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 representatives, split at the discretion of industry between external consultant costs and internal time.</td>
<td>£0.05m/yr</td>
<td>£0.04m/yr - £0.07m/yr</td>
</tr>
</tbody>
</table>

For blocks in the 26th round, total estimated future licence application is 131 in 2013 and 311 in 2022. There are an estimated additional 123 licence applications over the 20 year period (all in 2022) representing the additional areas for oil and gas extraction in the 27th round. Estimated application for CCS is 20

Assumptions the same for best-estimate apart from the number of future licence applications in the 26th Round advised by DECC

**Low cost scenario:** Oil & Gas: Number of future licence applications in blocks in the 26th Round with a ‘significant discovery’ or ‘fallow block with discovery’ 25% lower than best

The possibility of additional mitigation costs due to MCZs is not quantified in the IA due to the uncertainty about whether they could arise, and if so, where and to what degree. Additional mitigation costs could be incurred for future oil and gas installations if, for example, the footprint of the broad-scale habitat is small. However, the JNCC and Natural England advise that this is...
Please see Annex D for the profile of undiscounted costs and further detail on the calculation of costs.

**Confidence:** DECC, Oil & Gas UK and CCSA are content with assumptions of future licence numbers and additional costs.

Costs were calculated based on phases of the application process (for 26th round, 27th round and CCS) for all four regions. The costs were then scaled down based on the proportion of 127 MCZs that are a) the nearest environmentally sensitive area to blocks ‘potentially awarded’ in the 26th Round and 27th round and that are b) included in the 28 MCZs.

Please see Annex D with cost breakdown and further detail on calculations.

### 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. Additional one-off cost of £6750 per future licence applications (to consider potential impacts on broadscale habitats). Estimates provided by industry. This includes external costs for consultants (based on the average of two estimates from two UK environmental consultancy firms).

Please see Annex D for further information on cost estimates and calculations.

**Confidence:** Due to the amendments in site boundaries (to exclude areas with potential developments), many potential future (unknown) costs are removed and there is greater confidence in the costs to this sector.

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**Best estimate** is the midpoint of the low and high estimates in high cost scenario.

- **£0.1m/yr**
- **£0.04m/yr - £0.1m/yr**

**Sensitivity around licence application numbers and mitigation requirements.**

**Low cost scenario:** Licence applications required within 1km of MCZ (navigational dredging, disposal and future port developments) incur additional one-off cost of £6750.

**High cost scenario:** Licence applications within 5km – including all future applications. It also includes incorporating MCZ features into existing / planned Maintenance Dredging Protocols.(for navigational dredging only). Annex D for information on the assumption around MDPs. Site-specific mitigation costs were advised by Natural England. This scenario presents a low and high estimate (please see annex D for more information).

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### Maintenance Dredging Protocols

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.
<table>
<thead>
<tr>
<th>Recreation</th>
<th>Recreation activity in and near each MCZ was mapped as part of the Regional Project process, alongside vulnerability assessments of the sensitivity of features to the activities taking place.</th>
<th>No monetised costs</th>
<th>No/A</th>
<th>In some instances it was not possible to obtain sufficient information about potentially damaging activities on which to establish potential management scenarios (site Torbay).</th>
</tr>
</thead>
<tbody>
<tr>
<td>No monetised costs</td>
<td>Management scenarios for most MCZs are expected to have a negligible / no costs. Levels of the activity are low, alternative locations are available and the mitigation can be (or is already) provided through adoption of good practice (which should be adopted and existing codes of conduct).</td>
<td>£0.09m/yr</td>
<td>£0.003m/yr - £0.6m/yr</td>
<td>There is uncertainty around future licence applications within the 20 year period of this IA. MCZs which are considered likely for future developments (i.e. with high, uncertain costs) have been excluded from this tranche.</td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>Existing and planned activity mapped against MCZs. DECC provided information of potential future developments within the next 20 years. There are additional costs for licence applications for developments near MCZs, to assess the impact on MCZ broadscale habitats. There is a planned wind farm cable route through Blackwater, Crouch, Roach and Colne, as well as potential tidal and wave developments in South Dorset, Padstow and Surrounds and Isles of Scilly. An unlikely Scenario 2 assumes site specific mitigation costs (that these yet-to-be consented cables may need alternative methods of protection), with costs provided by developers.</td>
<td>Costs were assumed to incur to developments (existing or planned) in close proximity to rMCZs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Methodology, assumptions and sources
- **Public Sector**
  - Flood and coastal erosion risk management: £0.001m/yr
  - This includes additional costs for licence applications and Beachy Head West – one off cost for additional monitoring of £0.010m. No additional sensitivity.
  - Non monetised costs.
  - No sensitivity
  - None.
- **Renewable Energy**
  - DECC provided information of potential future developments within the next 20 years. There are additional costs for licence applications for developments near MCZs, to assess the impact on MCZ broadscale habitats. There is a planned wind farm cable route through Blackwater, Crouch, Roach and Colne, as well as potential tidal and wave developments in South Dorset, Padstow and Surrounds and Isles of Scilly. An unlikely Scenario 2 assumes site specific mitigation costs (that these yet-to-be consented cables may need alternative methods of protection), with costs provided by developers.
  - Costs were assumed to incur to developments (existing or planned) in close proximity to rMCZs.
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  - Costs were assumed to incur to developments (existing or planned) in close proximity to rMCZs.
  - Costs were assumed to incur to developments (existing or planned) in close proximity to rMCZs. |
| **Confidence:** Costs provided by EA, who will incur costs. | mitigation costs are anticipated to impact tranche MCZs. | **Confidence:** Costs provided by MoD. Anticipated costs are generic and may differ depending on the scale and nature of the military activities in each MCZ. | **Confidence:** Costs provided by MoD. |  
£0.008m/yr  
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.  
Costs scaled down for 28 sites (to 22%) as the costs applied for all the 127 sites.  
No sensitivity |  
The IA does not estimate the cumulative costs to MoD of impacts on activities occurring in more than one MCZ, or activities being impacted on by more than one MCZ, due to lack of information about what MoD activities would take place and where and what they would comprise. |

| **National Defence** |  
National Defence activity in and near to all potential MCZs assessed. Costs provided by MoD.  
**Confidence:** Anticipated costs are generic and may differ depending on the scale and nature of the military activities in each MCZ. |  
£0.008m/yr  
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.  
Costs scaled down for 28 sites (to 22%) as the costs applied for all the 127 sites.  
No sensitivity |  
The IA does not estimate the cumulative costs to MoD of impacts on activities occurring in more than one MCZ, or activities being impacted on by more than one MCZ, due to lack of information about what MoD activities would take place and where and what they would comprise. |

| **Costs to public sector of managing MCZs** |  
Costs provided by local authorities, landowners, IFCAs, MMO and Defra. For both options, 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).  
**Confidence:** Estimates don’t take account of possible cost savings of introducing one management measure that covers multiple MCZs or risk based prioritisation of monitoring. |  
£0.59m/yr  
Best estimate is the midpoint of the high and low cost scenarios. |  
£0.58m/yr - £0.6m/yr  
**Sensitivity around management.**  
**Low cost scenario:** looks at both non-regulatory and regulatory management measures.  
**High cost scenario:** only regulatory management measures for all MCZs. Both assume that only regulatory measures will be implemented in MCZs outside 12nm for recreation (including recreational angling) and commercial fisheries outside 6nm. This is because it is assumed it is impractical to implement non-regulatory measures such as voluntary agreements outside these limits. |  
Costs to the public sector to inform users of the marine environment about MCZs. |
### Ecological Surveys

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 JNCC. Costs for inshore sites based on cost estimates provided by Natural England and applied to number of features in each site.

**Confidence:** 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.

<table>
<thead>
<tr>
<th>Non-UK commercial fisheries vessels</th>
<th>Methodology and sources</th>
<th>Best estimate scenario</th>
<th>Low / High cost scenarios</th>
<th>Non monetised costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figures for non-UK vessels were gathered in the Regional Projects Process. Values of landings for non-UK fleets arising from within the suite of rMCZs were provided to the regional MCZ projects only for French fleets, and these data are separated into two categories only, mobile and static gears. Further landings information was provided in response to the consultation. 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.</td>
<td>Best estimate considers the GVA loss, consistent with assumptions for UK commercial vessels.</td>
<td>It has not been possible to make a quantitative estimate of the impact of MCZs on non-UK fleets (beyond French fleets) as was the case for the UK fishing industry. However, sites with potentially large, unmonetised costs were excluded from the options for designation in 2013.</td>
<td></td>
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</tr>
</tbody>
</table>

**Notes:** All assumptions reached through consultation with industry representatives during the Regional Project Process. Assessment of activities in and near each proposed MCZ was undertaken to enable site-specific assessments where appropriate. Regional project methodology documents, which underlie these assumptions and costs, were externally peer reviewed\(^\text{10}\). The consultation called for further information on these assumptions. Changes from consultation assumptions and activity information have been highlighted in the IA.

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\(^{10}\) [http://publications.naturalengland.org.uk/publication/1940011](http://publications.naturalengland.org.uk/publication/1940011)
Costs amendment based on consultation responses

6.10 All consultation responses have been analysed and considered to inform this revised final IA and as a result, many cost assumptions and final estimates have been amended. The summary of responses to consultation was published¹.

6.11 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, 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 costs already included in the baseline, from existing requirements, such as Water Framework Directive (WFD) or existing marine protections, and not additional costs due to MCZs.

6.12 40,632 responses were recorded, with over 95% in support of MCZs. The Government response to the consultation illustrates the breakdown of responses from sectors and organisations, as well as an overview of the main concerns raised following a designation of 28 versus 31 sites the total costs for each sector has decreased with fewer sites being designated. Site and sector specific changes to costs are described below:

**Impact of changes to business sector costs**

6.13 Domestic Commercial fisheries –The consultation specifically asked for information relating to the displacement assumption. 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 from existing fishing grounds². This assumption was tested during consultation. There were two sites where new information was provided that required new displacement assumptions. (i) Hythe bay – based on an IFCA survey (displacement is likely to be lower and most landings will be lost) (ii) Stour and Orwell – based on consultation response and subsequent discussion with the IFCA. Stour and Orwell has been dropped from the list of sites designated in 2013. The Minister has decided to defer designation of the Hythe Bay MCZ. This will allow a range of possible solutions to be explored (such as zonal management) with the local fishing sector, the local IFCA and NE with the aim of delivering the conservation aims for the site and allowing the continuation of economically-viable fishing, as such the costs should the site be designated, are likely to be lower than described here. A decision on whether to designate the site will be taken in early 2014. The IA has retained the 75% displacement assumption for this site to reflect this change in approach; however the high scenario still reflects 100% loss in earnings (no displacement).

6.14 For the designated sites, there was no new information from the consultation responses which enabled a change to the displacement assumption. The consultation also provided anecdotal evidence of landings data, which were verified with IFCAs and MMO landings data where possible and incorporated in the summary costs for the relevant sites. Where verification was not possible, quantitative anecdotal evidence was still incorporated, in the interests of including all additional information.

6.15 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 - Blackwater, Crouch, Roach and Colne Estuaries (increase in best estimate of fisheries costs); Cumbria Coast (no fisheries costs); and Manacles (increase in best estimate of fisheries costs). It was also observed that

² note that the high cost scenario estimates in IA already looked at a worst case scenario of no displacement i.e. all catch in this area lost
there was omission of a potential costs scenario for Poole rocks which has now been added making minimal changes to best estimate costs.

6.16 Further evidence was gathered to assess the impact which changes in national scallop management legislation and the management of European Marine Sites (EMS) would have on the costs for MCZs. A Centre for Environment, Fisheries and Aquaculture Science (CEFAS) study\(^3\) highlighted that, for offshore sites, most EMS lie outside the core dredging grounds used by larger vessels and, when intersections do occur, other areas of core dredging ground are in close proximity. However, for inshore vessels, a significant proportion of dredging activity within 12nm of the English and Welsh coasts takes place in EMS. More than half of the core areas of dredging activity\(^4\) were inside EMS. If dredging is restricted in EMS then this will limit the choice of areas to which vessels displaced from MCZ can relocate unless the MCZ already overlaps with EMS site\(^5\) (note that this only applies to certain MCZ sites, under specific scenarios of management).

6.17 Some information on costs was received from non-UK fisheries interests. However, as GVA information was not provided no changes have been made to non UK fisheries but these will be lower as fewer sites are being designated. These estimates are not included in the summary figures but described in the text of the IA.

6.18 **Ports, harbour, commercial fishing and disposal sites** – Consultation responses raised concerns regarding the costs of current and future (unplanned) potential developments and proposed alternative boundaries. A boundary change was suggested at Newhaven (relevant to MCZ site Beachy Head West) which would exclude the port harbour limits. This change has been accepted as there is limited loss of features and it excludes areas of potential developments resulting in greater confidence in the costs to this sector.

6.19 The boundary has also been changed for the Padstow Bay and Surrounds site. As the disposal site now lies outside the MCZ, mitigation costs associated with the disposal site are no longer relevant and have been removed. There is a low probability that some mitigation cost could be incurred in the future if significant amounts of material (more than usual) were disposed of at any one time\(^6\).

6.20 Local proposals for harbour development within the Torbay MCZ site have the potential to affect the subtidal mud and seagrass features. The seagrass is already protected as a BAP feature so any costs related to mitigating damage would be part of the baseline and not attributable to the MCZ designation. Proposals to extend Haldon Pier within Torbay would lead to some loss of the subtidal mud feature but this would be only a small proposition of the total area. Other potential impacts on the subtidal mud are speculative. The local proposals do not include plans for dredging. So overall there are no cost changes to the site.

6.21 ABP Ports raised a concern that additional costs could be incurred if ‘hazardous cargo exemption permits’ could not be permitted due to the designation of a nearby MCZ. Two MCZ sites Upper Fowey and Pont Pill and Dart estuary were investigated further on this basis\(^7\). Closer inspection of these ports identified that they are very unlikely to have ‘hazardous cargo’

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\(^3\) Interactions between inshore dredge fisheries and European Marine Sites (CEFAS, 2012); Interactions between scallop dredge fisheries and European Marine Sites (CEFAS, 2012)

\(^4\) Defined as the most heavily dredged areas accounting for 70% or 80% of total dredging activity in inshore waters

\(^5\) However, the CEFAS study notes that the assessment of overlap with EMS could be an overestimate: the approach used for defining core grounds may overweight the true importance of dredged areas. The bias exists because the patrol vessels and surveillance aircraft that record dredging activity do not visit all areas that may be fished. The methods of inshore analysis are based on older data (2007-2009), have relatively low spatial resolution and do not discriminate different types of dredging, therefore understanding options for displacement and consequences at the local level are challenging – site-level expertise is necessary for this local decision-making.

\(^6\) This could be managed at minimal additional cost by disposing of material at certain states of the tide to ensure material moves away from the MCZ boundary The disposal site is in a high energy environment and material is likely to readily disperse so this is only likely to be an issue should there be a significant increase in volume of material deposited, rather than for current usage

\(^7\) The Environment Agency advised that this could apply to ports storing hazardous cargo within 500m of an MCZ where no other existing environmental designation exists. A GIS extraction identified that this could apply to the following MCZs: Upper Fowey and Pont Pill proposed MCZ - Ports are Fowey and Polruan; Dart Estuary recommended MCZ – Ports are Dart Harbour, Britannia Royal Naval College and Dart Marina.
licenses as they are either small fishing harbours or marinas. Therefore no changes have been made to IA.

6.22 **Renewable Energy:** Consultation responses corrected figures for the possible future MCZ sites. North of Lundy and Morte Platform, increasing and decreasing the costs respectively, however these sites are not proposed for designation in the first tranche. Responses also mentioned possible future tidal energy resources in specific sites, which could result in costs. However, DECC do not consider these areas as ‘developable’ within the 20 year period of the IA.

6.23 **Aquaculture:** Follow up to the consultation indicated that the consultation IA had not included the possibility that aquaculture will need to be managed in the MCZ site Upper Fowey and Pont Pill. This is now added as a new cost scenario, although we currently expect no management to be required. If additional management measures are required in the future, evidence scenarios will be considered taking full account of any associated socio-economic impacts.

6.24 **Cables:** Consultation responses provided additional baseline information on existing cables, and highlighted a number of newly proposed cables which have not changed the management scenarios costs, since as per existing advice the new cables are very unlikely to require additional mitigation (low footprint of activity relative to the broadscale habitat).

6.25 **Historic Environment:** There were concerns of potential unmonetised restrictions to activity in consultation responses. However, intrusive archaeological activities combined with policies and legal requirements to preserve historic sites have already been considered under the costs of MCZs. The only areas where intrusive activities and anchoring could be limited in tranche 1 are peat and clay beds, or small areas of MCZs where vessel anchoring is restricted. These restrictions exist under the baseline, since peat and clay beds are already protected under existing lists and there are already some codes of conducts in place to protect any sensitive features such as archaeological sites and seagrass beds. In all cases, diver trails, visitors and non-intrusive surveys can continue. As with all activities, the Public Benefits Test (as described in para 6.7 point 2) would apply; regulators would be advised by English Heritage and any other relevant adviser.

6.26 **Other energy (coastal infrastructure/cooling):** This sector was not separately mentioned in the consultation IA. Consultation responses mentioned that a situation could arise where by plants in or near a MCZ are prevented from abstracting water for cooling purposes. It is assumed that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management process (unless where the size of the Water Framework Directive water body is different to the size of the MCZ). It is possible that any future developments (such as new plants) could potentially incur additional costs but it is not possible to monetise these at this stage.

There could be an additional licence cost (to assess impact on broad-scale habitats) and mitigation cost (to avoid environmental impact) on an existing or planned outfall pipe within a MCZ. However, consistent with advice from SNCCBs for other sectors, we are assuming this is only likely to be the case where the coastal MCZ habitat feature covers a small area therefore the proportion of protected habitat area affected could be great. This incidence is likely to be low probability, especially where the habitat is small enough to be avoided through forward planning at no significant additional cost. However, an additional cost could occur where avoidance of impact on MCZ protected habitat is a) unavoidable or b) avoidable but at significant extra cost. This is more likely to be the case for new capital works rather than maintenance on existing outfalls. This could present significant potential unknown costs for some applicants. Environment

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8 Provided by the Statutory Nature Conservation Bodies
9 The response does not ask this to be costed, just that it is mentioned for relevant MCZs
10 WFD requires assessment of water status at a water body scale – and water bodies in estuaries and coastal waters can be a considerable size (0.1km² to 1200 km²). This can mean that to create a change in waters status, there needs to be a widespread impact at this whole water body scale. The directive looks to achieve good ecological and chemical status of waters, which includes looking at the status of ecological elements such as benthic habitats within the water bodies.
Agency and Natural England have advised that additional licence or mitigation costs for environmental permits to dispose at sea (via outfall) are unlikely due to MCZs.

6.27 **Recreation:** Consultation responses mentioned a number of recreational activities taking place in and around MCZs. For the majority of sites no new information on activities was submitted which would impact on the management of MCZs and therefore incur costs. For the Torbay site concern was raised regarding the potential pressure on the subtidal mud from increased anchoring outside the harbour area. However it is not possible to predict whether and to what extent local proposals for increases in berths and moorings within the harbour will lead to increased anchoring outside the harbour on the subtidal mud. Due to the degree of uncertainty around what, if any, of the local proposals will be implemented, and their potential impacts, it is not possible to quantify any potential costs associated with mitigation of speculative impacts on the subtidal mud feature. There is also uncertainty in predicting costs linked solely to the subtidal mud and excluding costs for mitigation required for the seagrass (which would be part of the baseline).

6.28 **Aggregate extraction** – Certain aggregate industry responses stated that if neither boundary nor feature extent changed for MCZ site Kingmere, then the costs to aggregate industry will be far greater than in the IA. This is because the MCZ overlaps with two licence application areas (453 & 488) where currently no aggregate extraction takes place. The site boundary has not been changed but the IA already includes an additional licence cost for these application areas. The additional costs included in the IA is mitigation for a 3-month curtailment of activity during the Black Bream nesting season for existing aggregate areas under production that are within 1km of the MCZ. In a very unlikely scenario if aggregate was not allowed to be extracted from the application areas (at all rather than just the 3 months) in the future, it would only be an economic cost if the resource could not be found from elsewhere.

6.29 **Oil & Gas:** There are no changes due to consultation responses. Figures have reduced due to smaller selection of sites.

*Costs changes to public sector costs*
6.30 National Defence - Responses questioned whether costs to MoD for creating by-laws for managing and the policing of navigation activities have been taken into consideration. However, the IA already includes costs that MoD will incur in adjusting Maritime Environmental Sustainability Appraisal Tool (MESAT) and other MoD environmental assessment tools in order to consider whether its activities will impact on the conservation objectives of MCZs\(^{11}\). It also includes additional costs in adjusting electronic charts to consider MCZs.

6.31 Flood and coastal erosion risk management - There are no changes due to consultation responses. Concerns were raised that designation of the MCZ in Pagham Bay may affect future consideration of coastal protection projects. Given that the site is already well protected by other designations (SSSI, SPA, Ramsar, Local Nature Reserve) the presence of an additional MCZ designation will not have any additional effect on future decisions of whether to undertake well-thought out and cost-effective plans for coastal protection.

6.32 Costs to public sector of managing MCZs – Costs have been updated to reflect changes in fisheries and recreational management for the following sites (due to addition or removal of features based on new scientific evidence) - Blackwater, Crouch, Roach and Colne Estuaries; Cumbria Coast; and Manacles.

6.33 Ecological Surveys - Updated to reflect revised costs from JNCC (now based on actual surveys) and revised number of features per MCZ for inshore sites (which is what NE costs were based on). The survey costs now include costs for baseline setting surveys and monitoring surveys only. Verification costs for all MCZs were removed from the costs as a) this is a sunk cost and b) is a result of the MCAA and is a cost incurred irrespective of, and prior to, whether MCZ is designated or not.

Costs to Business (Equivalent Annual Net Costs Business)

\(^{11}\) MoD, pers. comm., 2011
6.34 Costs to business have been calculated in line with the Better Regulation Framework manual\(^\text{12}\). 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. 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, incorporating full costs.

6.35 Assumptions had to be made on e.g. the number of licence applications and likely mitigation. This was verified with industry representatives on a case-by-case basis. This uncertainty is also tested in the sensitivity analysis, as described in table 4. 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 4.

6.36 This figure is illustrative only, based on potential scenarios of costs. Decisions on the actual management (and resulting costs) will be taken on a site-by-site basis by the MMO and IFCAs, with consultation process and associated regulatory IA. These costs are taking a best estimate of what these costs \emph{may} be.

6.37 Within the baseline option it is assumed that existing government policies and commitments related to the marine environment are fully implemented and achieve their desired goals. Particularly significant are commitments to implementation of the Environmental Impact Assessment Directive and the Water Framework Directive. In light of this, the IA assumes that no mitigation of impacts of water abstraction, discharge or diffuse 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 0.5m/yr (2009 prices and 2010 base year). The PV cost to industry is £8.3m discounted over 20 years (PV base year is 2013). The benefits have not been monetised so they only reflect costs.

\textit{Risks, sensitivities and limitations of costs methodology}

6.38 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.

6.39 For many sectors, including Oil& Gas, National Defence, aspects of Renewable energy, some of the assumptions for this IA cannot be site specific, because it is not yet known where future developments will be or what they will comprise. Assumptions and results of sensitivity analysis have been taken at a regional level and verified with relevant industry representatives\(^\text{13}\).

6.40 There is uncertainty in the displacement 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 consultation was incorporated in the Impact Assessment. These assumptions will be tested through evaluation of the 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\(^\text{12}\)\(^\text{13}\)

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\(^{13}\) 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.
scientific or socioeconomic evidence on this displacement and any resulting environmental impact to incorporate into costs estimates.

7. Benefits

7.1 The marine environment provides us with many benefits, such as food in terms of fish and shellfish, and giving millions of people the chance to enjoy sailing, angling, watching birds and other wildlife and providing environmental resilience. These can be described as ‘Ecosystem Service’ benefits. Ecosystem services are defined as services provided by the natural environment that benefit people (Defra, 2007), several of which can be considered public goods as discussed in para 2.3. The ecosystem services that may be provided by the marine environment (and MCZ features) have been assessed under the categories set out in Table 5.

<table>
<thead>
<tr>
<th>General Ecosystem service categorisation</th>
<th>Final ecosystem services assessed in the IA</th>
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<tbody>
<tr>
<td>Cultural</td>
<td>Recreation</td>
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<tr>
<td></td>
<td>Research and education</td>
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<tr>
<td></td>
<td>Non-use values - Non-use value as a category may include &quot;option value&quot; (the value placed on individual willingness to pay for maintaining an resource even if there is little or no likelihood of the individual actually ever using it), &quot;bequest value&quot; (values placed on individual willingness to pay for maintaining or an asset available for future generations); &quot;Existence value&quot; (benefit people receive from knowing that a particular resource exists) and &quot;altruistic value&quot; (the value placed on individual willingness to pay for maintaining resource so that others may make use of it)</td>
</tr>
<tr>
<td>Provisioning</td>
<td>Provision of fish and shellfish for human consumption</td>
</tr>
<tr>
<td>Regulating</td>
<td>Natural hazard protection</td>
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<tr>
<td></td>
<td>Environmental resilience</td>
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<tr>
<td></td>
<td>Gas and climate regulation</td>
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<td></td>
<td>Regulation of pollution</td>
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</table>

Benefits under baseline

7.2 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 paragraphs 5.2 and 5.3 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 assume a static baseline rather than a declining baseline where the feature condition continues to deteriorate leading to lower ecosystem service in the absence of MCZs being designated. Table 6 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

| Cultural | Recreation | In 2012, 286m leisure visits were made to the coast including coastal towns in England^{14}. In the 12 months to Sept 2012, 11.2m |

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UK adults participated in water sports and other water-based leisure activities, including boating, sea angling and coastal walking.\(^{15}\) The marine leisure sector added £1.29bn GVA between 1998 and 2007. Coastal towns added £2.26bn to GVA in 2005.

Based on NEA-FO project\(^ {16}\) estimates and visitor number estimates from Defra study\(^ {17}\) the baseline use value for the 24\(^ {18}\) MCZ sites is estimated to be approximately £37.7m over 20 years. These are partial estimates as it only looks at the value of existing visits made by divers and anglers to a pool of sites. This information was gathered through an online survey where respondents were presented with a series of choices between more or less desirable alternatives\(^ {19}\).

Research and education
Firms associated with the marine environment contribute over £40bn to GVA\(^ {20}\). MCZs, including related research and monitoring activities, may also act as a focal point around which to develop education events and facilities. Education, research and development in the marine environment contributed £478m to GVA in 2006\(^ {21}\).

Provisioning
Provision of fish and shellfish for human consumption
In 2011, the GVA of fishing, aquaculture, processing and preserving was £1.2bn\(^ {22}\).

Natural hazard protection
£1.5bn yr total value storm buffering and flood control (meta-analysis)\(^ {23}\); £300m 2004 value, avoidance cost of building flood control measures\(^ {24}\).

Environmental resilience
No economic valuation data available

Gas and climate regulation
£0.4-8.47bn yr 2002 values, avoidance cost; £6.74bn yr-1 marine Carbon-sequestration 2004 value, avoidance cost\(^ {25}\).

Regulation of pollution
Beaumont et al (2008) and Clarkson (2002) identifies the economic value of regulating services to the UK at £420m to £8.5bn. However, this value is for all of UK seas rather than the features the MCZ protects.

Notes of the table:
These are estimates of the UK marine environment rather than specific to MCZs (unless specified otherwise).
Detailed, site specific baseline benefit figures have been estimated for Torbay and Kingmere MCZ in Fletcher et al (2012).

**Benefits under preferred option: Designate 28 MCZs**


\(^{16}\) Kenter et al (2013) [http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUaphh%2bY%3d&tabid=82](http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUaphh%2bY%3d&tabid=82)

\(^{17}\) Risk and Policy Analysts (2013) Value of the Impact of Marine Protected Areas on Recreation and Tourism Services (in print)

\(^{18}\) Benefits were not estimates for Lundy as the site has already been designated as a Special Areas of Conservation. Additional features are added. Swallow sand and South west deeps are over 100m deep and the NEAFO studies did not provide valuation estimates for individual visitor (using travel cost as a proxy) for these sites which is why they were not included in benefit estimation.

\(^{19}\) Here, the researchers provided the respondent with choice tasks where the respondent was asked to consider hypothetical diving or angling sites with a range of environmental and recreational attributes including travel distance, which was used as a cost-proxy. Participants were asked to choose between two sites, A and B, and a ‘stay at home option’. Recreational WTP was based on a estimate of return car travel cost of £0.088 per mile.


\(^{21}\) Defra, 2010, UK National Ecosystem Assessment, 2011


\(^{23}\) UK National Ecosystem Assessment, 2011 from Fletcher et al (2012). Total value of service assuming it is present in all UK coastal wetland.

\(^{24}\) Beaumont et al., 2006

\(^{25}\) UK National ecosystem assessment (2011) and Beaumont et al. (2006), from Fletcher et al (2012)
7.3 Designation of MCZs will help to conserve the range of biodiversity in UK waters. A combined area of approximately 10,100km$^2$ will be protected by the designation of MCZs and 165 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.

7.4 MCZ designation brings benefits from the:

- Flows of ecosystem services from specific features and habitats MCZs will protect. Under the preferred option only features that are in unfavourable state (and would continue to be unfavourable in the absence of MCZs) and have been assigned a ‘recover objective’ are considered to yield additional benefits. Similarly, some features are already protected by existing legislation and benefits from these features are not considered additional to MCZ designation unless they are offered a high level of protection under MCZs.

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

7.5 The different types of ecosystem service benefits expected to improve due to MCZ designation are assessed in detail in this section. Where possible additional benefits from MCZ designation have been quantified (see table 7). Relevant research has been used to further monetise some of these benefits (recreational benefits); although due technical uncertainty of the estimates means these have largely been presented as illustrative only. See Annex B and C for information on some of these studies.

7.6 There is a lack of scientific and economic research on the marine environment suitable for adapting for use in benefits evaluation and this is acknowledged as a challenge in the literature beyond this IA$^{26}$. This is because of both scientific uncertainty and the lack of traded markets for some of the benefits anticipated from MCZs. In order to address some of the evidence gaps Defra has commissioned new research to consider the marginal benefits of improvements in seabed habitats$^{27}$. In addition, future evaluation of MCZs and research anticipated to stem from designation is likely to enhance our quantified evidence in this area.

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**Benefits from designation of specific features and habitats in MCZs**

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$^{26}$ Interim results from the National Ecosystem Assessment marine workpackage state that there is a huge lack of valuation evidence (primary evidence) in this area.

$^{27}$ To be published in 2014
7.7 Many of the specific features of MCZs have been shown to contribute to certain 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 and other types of protected area e.g. EMS. 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’ conservation objective are expected to improve to favourable condition and features with a ‘maintain’ conservation objective are expected to remain in favourable condition under MCZ designation.

7.8 By including only the benefits flowing from the features for which condition will improve due to MCZ designation i.e. those with a ‘recover’ conservation objective, the IA provides a conservative benefits estimate. There will be benefits from protecting features in their current favourable state (i.e. with conservation objective ‘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.

7.9 Table 7 below provides the list of ecosystem services that are derived from the features. It also provides a quantification of benefits in terms of the size of the feature (where information on extent of feature is missing record numbers or sample observations are provided). Benefits from recreational services have been monetised for illustrative purposes. 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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28 E.g. Ospar list of threatened and declining species and habitats, etc.
Table 7: Benefits from protection of MCZ features and designation of sites

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Description</th>
<th>Quantification (where possible)</th>
<th>Certainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreational Services</td>
<td>Recreational activities most likely to benefit from MCZs include recreational angling, diving and wildlife watching. Benefits to recreation are expected to stem both from changes to the ecological condition of the marine environment and from the designation label (regardless of any ecological changes). Improvements in the condition of marine habitats and species are likely to enhance the recreational experience for participants, and increase the value of the recreational ecosystem service. For example, bird populations may benefit from the protection of benthic habitats that contribute to the provision of good foraging grounds. Bird watchers may benefit from resultant improvements in bird watching experiences. There is an insufficiently developed evidence base on which to relate ecological improvements to the use-value component of recreation ecosystem services.</td>
<td>While overall monetisation of the benefits from an increase in recreational use has not been possible, an illustrative example of the scale of monetised benefit is shown in Box 4 for recreational use benefits. This provides an indicative use value of £38.3m to £77.3m over the 20 year period for the designated sites, with £5.1m to £10.4m estimated for the designated sites illustrative benefits for tourism. Due to the uncertainties with both the baseline and change in visitor frequency, this figure is not used in the summary pages.</td>
<td>Med - High confidence in existence of features; medium confidence of benefit to recreation, with low confidence in scale of illustrated monetisation.</td>
</tr>
<tr>
<td>Non-use / bequest values</td>
<td>Some groups are often keen that features and sites are preserved even if they are not currently using them and hence derive non-use benefits from protecting the site. These non-use values then 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); 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).</td>
<td>Based on Willingness to pay estimates derived from Kenter et al study (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 alone estimated at £152m to £301m (Best estimate £227m) one off to protect 24 of the designated sites. Further explanation on the estimates is provided in Box 4, Annex C and paras 7.10 to 7.14</td>
<td>Med - High confidence in existence of features.</td>
</tr>
<tr>
<td>Research and education</td>
<td>MCZ research and monitoring will contribute to our understanding of marine ecosystems and potential beneficial uses of marine species. Improvement in knowledge will support more effective marine planning and licensing in UK waters. The scale of research benefit depends on the scale of additional information gathered and the ability of information to enable better decisions to be made in the marine environment. There are specific research gaps in the effectiveness of MPAs in temperate areas and the role of biodiversity in ensuring the resilience of ecosystem service provision, to which these MCZs could contribute. Shore-accessible MCZs likely to benefit the greatest number of people for educational uses. Any educational benefits for Estuaries, Rocky bottom, Coral reefs, are of particular interest to researchers but designation of all features (CO set at recover or maintain) is likely to improve the understanding of these ecosystem services.</td>
<td>Med - High confidence in existence of features; relatively high confidence that there will be a benefit to research and education due to these designations</td>
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</tbody>
</table>

1 Kenter et al (2013), page 19
2 [http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2bY%3d&tabid=82](http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2bY%3d&tabid=82)
3 Benefits were not estimates for Lundy as the site has already been designated as a Special Areas of Conservation. Swallow sand and South west deeps are over 100m deep and the NEAFO studies did not provide contingent valuation estimates for these sites which is why they were not included in benefit estimation.
<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Description</th>
<th>Impacts</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intertidal mud</td>
<td>Designated as maintain</td>
<td>Fish and Shellfish for human consumption</td>
<td>CEFAS have provided an expert opinion that spillover benefits of MCZs may be 0-15% of catch lost from the MCZ, which has the potential for benefits to commercial fishing as well as recreational anglers. This could lead to an illustrative GVA benefit of £0.01m/yr after 5 years for commercial fishing, with a range from £0m to £0.3m/yr.</td>
</tr>
<tr>
<td>Coastal saltmarshes</td>
<td>Designated as maintain</td>
<td>Natural Hazard protection</td>
<td>Mudflats, Intertidal wetlands are habitats of high importance for natural hazard protection. Estuaries and Coral reefs are also important. These are all protected under MCZs. It is highly uncertain whether a change in the condition of features will impact the level of natural hazard protection.</td>
</tr>
<tr>
<td>Intertidal rock</td>
<td>Designated as maintain</td>
<td>Environmental resilience</td>
<td>The full range of different features and habitats is important, especially those which are not protected by other designations.</td>
</tr>
</tbody>
</table>

4 Regional project Methodology Documents Annex H5
5 Based on a conservative assumption of 5% of the lost GVA
6 Fletcher et al (2012)
7 Hughes and others, 2005; Tilman, Reich and Knops, 2006; in Beaumont and others, 2006.)
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. See discussion in para 7.15 below, of the anticipated overall benefits of an MCZ network.

| Gas and climate regulation | Certain habitats are efficient sequesters of carbon and contribute to gas and climate regulation. Management of MCZs may reduce human pressures on these habitats that may result in a net increase in the rate of carbon sequestration. | Intertidal mud (designated as maintain), coastal salt marshes (designated as maintain) and saline reed beds (designated as maintain), the deep-sea bed (655.54 km²) and seagrass beds (0.92 km²), are particularly efficient sequesters of carbon. Intertidal mud (designated as maintain), coastal salt marshes (designated as maintain) and saline reed beds (designated as maintain), the deep-sea bed (655.54 km²) and seagrass beds (0.92 km²), are particularly efficient sequesters of carbon. | High confidence in existence of features; medium confidence in impact on carbon sequestration. |

| Regulation of pollution (nutrient recycling) | MCZs also contribute to regulation of pollution (nutrient recycling). To the extent that MCZs will contribute to healthier and more diverse ecosystems, they are anticipated to aid the environment’s capacity to process waste and protect the regulating capacity of the marine environment. | Subtidal sediment habitats can act as pollution sinks, aided by the fauna resident within them (12494.47 km² set to recover). Salt marshes (designated as maintain) and seagrass beds (0.92 km²) are thought to be particularly good regulators of pollution. | High confidence in existence of features; low confidence in impact on regulation of pollution. |

---

8 OSPAR (2010)
10 (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 CO2; converted to km2 for comparison with area of feature.
11 (Beaumont and others, 2006; Fletcher and others, 2012; Austen and others, 2011.)
12 Results based on UK National Ecosystem Assessment, 2011
valued household willingness to pay for better coastal water quality in Scottish beaches at £5.81/person\textsuperscript{13}, which is significant with the context of the 11.2m UK adults who participated in water-based leisure activities in 2012\textsuperscript{14}. The changes in management proposed for the small areas will not have the noticeable impact which was valued in any of these studies. Overall, this will be a very small scale of impact.

Notes on table:

- Extent (area covered) of features are provided for those who are set to recover (rather than) as management of these will provide higher ecosystem services. However there is a cumulative impact of designating all features that will improve ecosystem services
- Where square km was not available number of records or samples of the feature is provided
- Note that size of feature does not necessarily translate into the scale of ecosystem service benefit.
- Information on extent of features is likely to change with more detailed modelling and surveying work in process – the km\textsuperscript{2} for the purposes of the IA uses the most up-to-date information available, which is mainly that provided from the Regional Projects.

\textsuperscript{13} Hanley et al. (2003) combine TCM and CB data to estimate the WTP for better coastal water quality in the UK. The survey was implemented in Scotland at seven different beaches. The results suggest a 1.3\% increase in the number of trips should water quality improve with an associated increase in consumer surplus of 5.81 GBP/person or 0.48 GBP/trip. Using a population estimate of 661,110 persons, this gives a figure of aggregate benefits of 1.25 million GBP/yr. Hanley, N., Bell, D., and Alvarez-Farizo, B. (2003) Valuing the benefits of coastal water quality improvements using contingent and real behaviour. Environmental and Resource Economics 24: 273–285.

\textsuperscript{14} Figure from 2012, Watersports and leisure participation survey 2012 http://www.dft.gov.uk/mca/watersports_participation_survey_2012_-_executive_summary.pdf
7.10 It can be seen from Table 7 that a lot of the MCZ features provide valuable ecosystem services (that result in increase in human welfare) even if it has not been possible to fully quantify or monetise these benefits.

7.11 Monetary estimates have been provided for recreational services using recent research by Kenter et al (2013)\(^1\). 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 Marine Conservation Zones (rMCZs) and 7 existing Welsh marine Special Areas of Conservation (SACs) using a combination of monetary and non-monetary valuation methods and an interactive mapping application to assess site visit numbers. The results are based on an online survey with 1683 divers and sea anglers run between December 2012 and January 2013. Finally, the results presented Box 4 have not been adjusted to reflect new information on feature certainty or boundary changes made in the site designation.

Box 4: Monetisation of recreational benefits

**Non-use values – Willingness to Pay by divers and sea 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). They carried out a case study on 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\(^2\).

Based on their results per site (using contingent valuation method (CVM)), it is estimated that UK divers and anglers are willing to pay £152m to £302m (Best estimate £227m) one off to protect 28 sites\(^3\). 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\(^4\). 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).

Annex C provides a summary of the methodology used to arrive at these estimates.

**Use values - Recreational benefit from increase in visitor number to designated MCZs**

A Defra-commissioned study\(^5\) illustrated the potential for additional use value due to MCZ designation. Based on the limited evidence available from a literature review, the study considered a scenario of a 5-10%\(^6\) increase in the frequency of visitation when considering the cumulative impacts of designation on site-specific conservation value to specific users, the provision of facilities and additional promotion.

Travel cost figures\(^7\) for each recreational use were used to calculate the economic benefit for any increases in frequency of visitation and potential new visitors (as reported in the MENE survey)\(^8\). As well as the revealed spend on travel cost and...
tourism, there is the potential that users may gain additional welfare (as measured by consumer surplus\(^9\)) from their visit, due to improvements in experience. Very few studies were found to be suitable for benefit transfer purposes (due to the geographical location and policy changes under consideration) with limited coverage of the recreational activities. When considered suitable these were applied to the MCZ case study sites\(^10\).

This exercise was carried out for 5 representative case studies, categorised according to their recreational and tourism value and geographical spread, and then applied to the remaining 22 sites on a per km\(^2\) basis by site type. Total discounted benefits to recreational users were estimated to range from £38.3m to £77.3m over the 20 year period for the designated\(^11\) sites. This was considered net of likely displacement, i.e. only including additional visitors, rather than those substituting their visit from other sites\(^12\). Excluding consumer surplus, the benefit ranges from £20m to £41.5m.

Additional tourism spend is also anticipated, relating to the increase in recreation activity. Tourism spend includes non-travel related expenditure, such as accommodation, food and drink and activity costs. Net of likely displacement, a total tourism spend benefit of £5.1m to £10.4m was estimated for the 28 sites\(^13\), discounted.

7.12 The estimates in Box 4 provide an indication that there are potentially high benefits for recreational users from using or protecting these sites. While the recreational benefits have been monetised for illustrative purposes, uncertainty over the scale of benefits means they have not been used in the summary sheets. 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)\(^14\) and the estimates value individual’s perception to restricting the sites rather than actual ecological protection following designation.

7.13 For the use values there is considerable uncertainty on the visitor numbers (of divers and anglers) to these sites. The Defra benefit study uses stakmap to estimate a baseline level of visits to the site (by various recreational users) and are likely to be an underestimate of the true number of visitors. Also there was very little evidence to understand the likely increase in visits from designating the sites, which is why the ‘use estimates’ derived from the study are for illustrative purposes only.

7.14 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.

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\(^9\) Consumer surplus measures the monetary benefit to the user as the difference between what they would be willing to pay and what they actually pay. This is calculated as the stated benefit to participants over and above what participants have been demonstrated to pay through travel cost (i.e. their revealed benefit).


\(^11\) Benefits were not estimates for Lundy as the site has already been designated as a Special Areas of Conservation.

\(^12\) For this displacement assumption, the study team considered other Marine protected Areas with similar characteristics within a local area. This is important since we are only considering the additional benefit at a UK level for benefits calculations - a shift in visit (and tourism spend) from another site would not be an additional benefit, but a transfer from one local area to another.

\(^13\) These were limited to a few recreational categories (angling and informal recreation).

Anticipated overall benefits of an MPA network

7.15 Marine protected areas already exist in the form of European Marine Sites (EMS) designated under the EU Habitats and Birds Directives, Sites of Special Scientific Interest (SSSI) and Ramsar sites. The MCZs to be designated have been chosen to add to and complement these, to contribute towards an overall network of marine protected areas. An overall network of marine protected areas, 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.

7.16 By protecting a range of representative features from across the marine environment, the government are 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\(^\text{15}\).

7.17 Mobile fish species are considered likely to benefit from Marine Protected Areas 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.

7.18 While existing sites have not been specifically designed to protect mobile fish species some of the 28 MCZs include breeding nursery areas and management measures taken to protect the features are likely to result in reduced fishing pressures in some sites.

Changes in benefits due to consultation

7.19 The benefit section has changed substantially following comments from consultation. These changes include:

- Quantification of benefits – The consultation responses highlighted the lack of quantification of benefits in the IA. To address the comment during the consultation period the benefits assessment was updated to include latest research and responses to the consultation. Where possible, the marginal or additional benefits from MCZ designation are quantified (see table 7).

- 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. This links back both to scientific uncertainty and the lack of traded markets for some of the benefits anticipated from MCZs. In order to address the evidence gaps Defra has commissioned new research to consider the marginal benefits of improvements in seabed habitats. In addition, future evaluation of MCZs and research which will stem from designation is likely to enhance our quantified evidence in this area.

• Using evidence submitted during consultation – The Marine Conservation Society submitted the research which is also a part of the one of four case studies for the Shared, Plural and Cultural Values work package of the follow-on phase of the UK National Ecosystem Assessment (NEA). The results of the study have been thoroughly reviewed by Defra and used it the manner it considered suitable given the uncertainty in estimates. Please refer to paras 7.11-7.14 and Annex C for more information on the study.

Risks, uncertainties and sensitivities

7.20 The IA assumes that features will continue to remain in their ‘favourable’ or ‘unfavourable’ condition over the 20 year period (i.e. their condition will not deteriorate). This is due to a lack of site-specific knowledge on the change in feature condition (see paragraphs 5.2 and 5.3 above). This could potentially underestimate the benefits.

7.21 It has been challenging to quantify the increase in benefits arising from ecological improvements in the features following designation. It is even harder to estimate the network benefits from designating the tranche of sites. While there is strong evidence (as presented in table 5) to support the likelihood of increase in ecosystem serves, given the uncertainty it has been hard to pin down the extent of increase in these services and what they mean monetarily. This is likely to result in a relative bias against the benefits versus the costs. To overcome this IA has provides an indication of the scale of these benefits by providing a illustration of recreational benefits in monetary terms. Defra is currently carrying out research to understand how best to value these marginal improvements in ecosystem services.

7.22 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) and the risk of damage remains while these data certainty issues are resolved.

MCZ Post implementation Review Plan

7.23 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 will 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 on the degree to which MCZs and the MPA network are achieving objectives, stating steps that may be necessary for success. The MCAA allows MCZ designating orders to be reviewed, amended or revoked, and the Government intends to keep MCZs under review, 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 or de-designations will be accompanied by an impact assessment setting out the costs and benefits of such changes.
Conclusion

7.24 There are potentially large benefits to designating 28 sites. A combined area of approximately 10,100km$^2$ will be protected by the designation of MCZs and 165 features (habitats, species, geological and geomorphologic features) will be conserved. This 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.

7.25 The total estimated quantified economic costs of the 28 sites proposed for designation in 2013 ranges from £1.8m/yr to £7m/yr and best estimate is £2.2m/yr. This gives a present value of between £25.9 and £102.6m and a best estimate of £32.7m over the 20-year timeframe of the IA. The best estimated annual cost to business is £0.5m/yr. The main costs to industry are for ports and shipping (£0.1m/yr), commercial fisheries (£0.25m/yr) and renewables (£0.09m/yr).

7.26 The main costs to government under preferred option are £0.59m/yr (best estimate) for management and enforcement of sites, £1.1m/yr (best estimate) year for survey work as well as small costs to national defence (£0.008m/yr) and flood and coastal erosion (£0.001m/yr). In addition there are some costs that have not been quantified. There is possible cost to water abstraction industry from MCZs and these costs are likely to be additional to those from the Water Framework Directive. Sectors where future projects were highly uncertain have not been quantified (archaeology, oil and gas; ports, harbours and shipping; laying of inter-array cable protection). 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.
References


Fletcher, S., Saunders, J., Herbert, R., Roberts, C., & Dawson, K. 2012 (a). Description of the Ecosystem Services Provided by Broad-scale Habitats and Features of Conservation Importance that are Likely to be Protected by Marine Protected Areas in the Marine Conservation Zone Project Area. Research report produced for Natural England. NECR088


http://www.wildlifetrusts.org/sites/default/files/Securing%20the%20benefits%20of%20MCZs.pdf


JNCC and Natural England 2011b. Advice from the Joint Nature Conservation Committee and Natural England with Regard to Fisheries Impacts on Marine Conservation Zone Habitat Features. URL:


Risk and Policy Analysts, 2013. Value of the Impact of Marine Protected Areas on Recreation and Tourism Services, Case studies, Methodology and Literature Review report for Defra,


South West Tourism recreational workshop. Marine Protection Areas: Opportunities and challenges for tourism


Title: 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)

Impact Assessment (IA)

Date: [24th September 2015]

Stage: Final

Source of intervention: Domestic

Type of measure: Secondary Legislation

Contact for enquiries: Juliette Hatchman, juliette.hatchman@defra.gsi.gov.uk

Summary: Intervention and Options

RPC Opinion:

Cost of Preferred (or more likely) Option

<table>
<thead>
<tr>
<th>Total Net Present Value</th>
<th>Business Net Present Value</th>
<th>Net cost to business per year (EANCB on 2014 prices)</th>
<th>In scope of One-In, Three-Out?</th>
<th>Measure qualifies as</th>
</tr>
</thead>
<tbody>
<tr>
<td>£-31.36m</td>
<td>£-4.50m</td>
<td>£0.31m</td>
<td>Yes</td>
<td>IN</td>
</tr>
</tbody>
</table>

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 2nd tranche of 23 MCZs and some additional features in the 1st 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.

Will the policy be reviewed?

It will be reviewed.

If applicable, set review date: 2018

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.

Micro Yes < 20 Small Yes Medium Yes Large Yes

Traded: N/A Non-traded: Unquantified

What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)

Traded: N/A Non-traded: 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: ........................................
**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**

<table>
<thead>
<tr>
<th>Price Base Year</th>
<th>PV Base Year</th>
<th>Time Period Years</th>
<th>Net Benefit (Present Value (PV)) (£m)</th>
<th>Total Cost (Present Value)</th>
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</thead>
</table>

**COSTS (£m)**

<table>
<thead>
<tr>
<th></th>
<th>Total Transition (Constant Price)</th>
<th>Average Annual (excl. Transition) (Constant Price)</th>
<th>Total Cost (Present Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>6.9</td>
<td>1.7</td>
<td>30.0</td>
</tr>
<tr>
<td>High</td>
<td>11.6</td>
<td>2.7</td>
<td>48.7</td>
</tr>
<tr>
<td>Best Estimate</td>
<td>7.0</td>
<td>1.8</td>
<td>31.4</td>
</tr>
</tbody>
</table>

**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 (£0.017m); 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)**

<table>
<thead>
<tr>
<th></th>
<th>Total Transition (Constant Price)</th>
<th>Average Annual (excl. Transition) (Constant Price)</th>
<th>Total Benefit (Present Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>High</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>Best Estimate</td>
<td>Unquantified</td>
<td>Unquantified</td>
<td>Unquantified</td>
</tr>
</tbody>
</table>

**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 10,812km² will be protected by designation of the 2nd tranche MCZs and 234 features. These are expected 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.

**Key assumptions/sensitivities/risks**

Discount rate (%) 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)**

<table>
<thead>
<tr>
<th>Direct impact on business (Equivalent Annual) £m:</th>
<th>In scope of OI3O?</th>
<th>Measure qualifies as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs: 0.31</td>
<td>Yes</td>
<td>IN</td>
</tr>
<tr>
<td>Benefits: Unquantified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net: -0.31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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
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 sites¹
RA – Reference Areas
RYA – Royal Yachting Association
SAC - Special Areas of Conservation (SAC)²
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)³
SSSIs - Sites of Special Scientific Interests⁴
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

¹ Sites designated as Wetlands of International Importance under the Ramsar Convention (1971).
⁴ 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)\(^5\), Special Areas of Conservation (SACs)\(^6\), Ramsar sites\(^7\), Sites of Special Scientific Interest (SSSIs)\(^8\), 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\(^9\). 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\(^10\) (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\(^11\) 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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\(^7\) Sites designated as Wetlands of International Importance under the Ramsar Convention (1971).

\(^8\) Designated under the Wildlife and Countryside Act 1981 (as amended).

\(^9\) [http://jncc.defra.gov.uk/page-2409](http://jncc.defra.gov.uk/page-2409)

\(^10\) Oslo and Paris Commission (Ospar) Guidance on Developing an Ecologically Coherent Network of OSPAR Marine Protected Areas, (Reference number 2006-3)

1.6 Following evaluation of the recommendations from the Regional MCZ projects and accompanying impact assessments, formal advice from the SNCS and advice from the independent Science Advisory Panel, 31 MCZ recommendations were considered suitable for designation in the 1st tranche and consulted on publicly in early 2013. The accompanying Impact Assessment (Defra 147512) 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 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 1st tranche, 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 2nd tranche in 2015 and a 3rd 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 2nd tranche of a proposed 23 sites ran from 30th January 2015 to 24th 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’ (O13O) 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 the regulators to achieve the conservation objectives of these designations. All direct costs and benefits are calculated using O13O 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 O13O 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. |

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13 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 as summed 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 2nd 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 1st tranche sites. These proposed sites and additional features from the 1st tranche are being considered as one package under the 2nd tranche. The process for selecting MCZs for the 2nd tranche follows similar principles to the 1st and this IA largely follows the same approach and methodologies used in the IA for the 1st 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 Projects as suitable candidates for the 2nd tranche. Sites which addressed ‘big gaps’ 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 2nd tranche sites, gaps in the network can also be filled by designating additional features in sites that were established in the 1st tranche. These are features that either:

- did not have sufficient scientific evidence when the 1st 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 1st tranche consultation and additional consultation was required to collect evidence on local management or socioeconomic impacts; or

15 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.
2.5 Defra identified 16 additional features in 10 designated 1st tranche sites that were suitable for inclusion in the consultation together with the recommended 2nd 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 1st 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 km²: approximately 2,500 km² in the inshore and 8,300 km² in the offshore. Further details on the 23 2nd 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 3rd 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 2nd tranche of MCZs

MCZs put forward for designation within Tranche Two

1. Coquet to St Mary’s
2. Farnes East
3. Fulmar
4. Runswick Bay
5. Holderness Inshore
6. Cromer Shoal Chalk Beds
7. The Swale Estuary
8. Dover to Deal
9. Dover to Folkestone
10. Offshore Brighton
11. Offshore Overfalls
12. Utopia
13. The Needles
14. Western Channel
15. Mounts Bay
16. Runnel Stone
17. Nor’West of Jones Bank
18. Greater Haig Fras
19. Newquay and the Gannel
20. Hartland Point to Tintagel
21. Bideford to Foreland Point
22. West of Walney
23. Allonby Bay

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. Fish landings and aquaculture from the marine environment have a market value, while non-traded services include flood control, recreation, research and education. A side from economic value, the natural environment has intrinsic or ‘non-use’ value. Recent work by the National Ecosystem Assessment Follow-On supports this and in particular highlights the significant importance of ecosystem services, including less tangible cultural benefits, derived from a good quality marine environment.

3.2 Human activities are having a detrimental effect on the extent and condition of many diverse marine habitats and their ecosystems. OSPAR noted that ‘a reduction in the decline in biodiversity is still a long way off’, and that combined pressures from human activities are not fully understood and need to be carefully managed to avoid undesirable impacts. 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.

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. 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 as 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. 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...
not necessarily have an economic incentive to voluntarily contribute effort or money to ensure the continued existence of these goods 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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4. Policy objective and intended effects

4.1 The UK administrations have committed 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 context. Our aim therefore is for the UK MPA s to contribute to an ecologically coherent network on a biogeographic basis and as a UK contribution to the wider OSPAR network, 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 s 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 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’ 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 2nd 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 1st tranche of MCZ sites were assessed in terms of their contribution to a network of marine protected areas. The SNCCs identified detailed ecological targets 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 SNCCs 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 2nd 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. 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. So me
uncertainties on the scale of impacts, which may have precluded consideration of a site in the 1st 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 2nd 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 2nd tranche of 23 MCZs and some additional features for sites designated in the 1st 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 1st Tranche consultation because additional features were not a part of the 1st 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.

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**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 information on costs to industry of these additional features not covered in the Impact Assessment that would be directly attributable to these 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 and the existing network of MPAs including the 27 MCZs designated as part of the 1st 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 2nd 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 2nd 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.

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 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.

33 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).

34 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.

35 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. 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. 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 2nd tranche of 23 MCZs, together with additional features in 1st 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 JNCC’s ‘gap-analysis’ work which was completed in Autumn 2013. 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 2nd tranche. There are a number of reasons why the additional 14 sites announced in February 2014 could not be considered for the 2nd 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.

36 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.

37 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 1st tranche MCZs designated in 2013. These are not costs attributed to the designation of 2nd tranche MCZs because they are already incurred or will be incurred in the absence of any further MCZ designations. 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 FO CI (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 1st tranche of MCZs and are now in the baseline (i.e. these costs would be incurred regardless of any further designation).

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

<table>
<thead>
<tr>
<th>Impacted Private Sector</th>
<th>Description of baseline costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate extraction</td>
<td>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.</td>
</tr>
<tr>
<td>Cables</td>
<td>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.</td>
</tr>
<tr>
<td>Coastal development</td>
<td>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.</td>
</tr>
<tr>
<td>Commercial Fisheries</td>
<td>The baseline includes current policies in force, such as: - Common Fisheries Policy (CFP) e.g. Limits on commercial fishing of quota stocks, discard</td>
</tr>
</tbody>
</table>

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38 Note that, consistent with Impact Assessment guidance, we assume that these previous policies have been effectively implemented.

39 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.
- Bans.
  - UK fisheries management e.g. IFCA byelaws on vessel size
  - Conservation measures in existing MPAs, e.g. Management of fishing in MPAs e.g. European Marine Sites (EMS), Tranche 1 MCZs
  - Voluntary codes of conduct.

**Archaeological heritage**

Current costs for licence applications, including licence applications for archaeological activities on Historic Protected Wrecks. 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.

**Oil & Gas**

Licence application costs, including costs of assessment of environmental impact to consider impact on FOCI (which are all covered by existing environmental legislation). Mitigation activities (such as pipeline routes, chemical release), may be required to avoid damage to these listed features, in the absence of MCZ designation.

**Ports, harbours, Commercial shipping and disposal sites**

Licence application costs, including costs of EIA to consider impact on previously designated FOCI. 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.

**Recreation**

Management and best practice advice in relation to potentially damaging activities such as anchoring and wildlife watching. Specific management of activities in existing MPAs.

**Renewable Energy**

Licence application costs, including costs of EIA to consider impact on FOCI. Mitigation (such as adjusting planned cable routes, using different turbine foundations, seasonal restrictions on activity), may be required to avoid damage to these features.

<table>
<thead>
<tr>
<th><strong>Impacted Public Sector</strong></th>
<th><strong>Description of baseline costs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>National Defence</td>
<td>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.</td>
</tr>
<tr>
<td>Flood and coastal erosion and management</td>
<td>Licence application costs, including costs of assessment of environmental impact to consider impact on previously designated FOCI. Mitigation (such as moving planned location or restrictions on construction activities) may be required to avoid damage to these features.</td>
</tr>
<tr>
<td>Costs to public sector for marine management</td>
<td>Costs to MMO, IFCA to monitor existing protected features and sites, enforce requirements of Common Fisheries Policy (CFP) and administration of the marine licensing process.</td>
</tr>
<tr>
<td>Ecological Surveys</td>
<td>SAC and SSSI monitoring; biodiversity monitoring to meet existing requirements under EU legislation carried out by NE and JNCC.</td>
</tr>
</tbody>
</table>

Box 3 below provides information on the stakeholder engagement process for the 2nd 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.
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 42, 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 2nd tranche MCZs in 2015. If any further features in the 2nd tranche MCZ sites are proposed for designation for the 3rd tranche, they will be included in the Impact Assessment for the 3rd tranche, the same way the additional features in the 1st tranche sites are considered here.

41 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.

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 1st 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 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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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. Existing activity which has already been licensed with consent conditions attached would continue after designation.

For sites within the 2nd 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 2nd 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 2nd 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.

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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 Acts (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. These will be determined on a site-by-site basis, considering what is required (based on advice from the SNCBs) to meet a 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 J NCC 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 OICo 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 2nd tranche. 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.

45. 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.
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 1st 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 1st 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 'in close proximity' to an MCZ. For the low-cost scenario, only two strategic resource areas are in close proximity to MCZs in the 2nd 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. The 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. Therefore no changes were made to the methodology for this sector.

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48 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 2nd tranche MCZs on the sector\(^\text{49}\).

7.13 For the sites being considered as part of the 2nd 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\(^\text{50}\), there are no aquaculture sites located in close proximity to any of the sites proposed for the 2nd 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 3rd 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\(^\text{51}\). 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\(^\text{52}\).

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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\(^{50}\) Crown Estate, pers. comm. 2014.


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. 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.

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 1st tranche IA. This estimate was maintained for the 2nd tranche IA. For the 1st tranche IA, the costs were calculated for all potential MCZs and then scaled down proportionally for the sites proposed for designation under the 1st tranche. The same approach was taken for the 2nd tranche IA. 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 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 2nd 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. 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, 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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54 http://nsninterconnector.com/
55 No specific methodology paper was developed previously as such impacts would be assessed on a site by site and project by project basis.
56 Natural England, pers. comm. 2015
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\(^{57}\) that specifies a range of possible management scenarios for each broad gear type\(^{58}\) (mobile and static) for each feature\(^{59}\). 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.

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\(^{60}\); 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\(^{61}\).

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\(^{62}\) 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 than designations themselves. When required regulators (MMO and IFCA) would produce IAs with any bye-laws to take account of these impacts and inform stakeholders.

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 2nd 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).

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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\(^{58}\) 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.


\(^{60}\) ICES use statistical rectangle areas for the gridding of data to make simplified analysis and visualisation of fishing effort, landings and revenues.

\(^{61}\) For information on how under 10m fishing revenues are calculated, see Cefas paper [MB0117](http://icesjms.oxfordjournals.org/cgi/reprint/fsu115?ijkey=FaJLWLjv39vUkSN&keytype=ref).

from existing fishing grounds. 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 1st tranche of MCZs and was further tested during the 2nd 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 CF, 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. 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 1st tranche IA, based on the advice of DECC, NE and J NCC. The same scenario is considered for the 2nd tranche which assumes that operators of oil, gas and carbon capture and storage (CCS) installations will incur additional costs for 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 2nd 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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63 The high cost scenario estimates in IA assume that there is no possible displacement i.e. all catch in this area lost
64 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 licensing rounds, and the stages of development that are carried out in each of those blocks over the 20 year IA period. For the 1st tranche IA, costs were scaled down based on the number of 1st tranche MCZs as a proportion of the whole suite of potential MCZs and the same approach is taken with the 2nd 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 2nd 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 2nd 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. 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.

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 may see issues

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65 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).

66 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 1st tranche IA, during pre-consultation for the 2nd tranche and through consultation responses. No required mitigation measures have been identified for any 2nd 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. 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 1st 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 recreational 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.

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 2nd tranche contain features sensitive to anchoring with a ‘recover’ objective and these are The Needles and Utopia MCZs. During pre-consultation 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 uses of the area, with higher levels than they had previously indicated. We also received new information about anchoring 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

67 MMO, personal communication 2015.
69 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\textsuperscript{70}. 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.

\textbf{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\textsuperscript{71}.

7.46 Since the Regional Projects presented recommendations in 2011 and the designation of the 1\textsuperscript{st} 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\textsuperscript{72}, 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\textsuperscript{nd} 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\textsuperscript{nd} 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.

\textsuperscript{70} Natural England, personal communication 2015.
\textsuperscript{72} 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.

7.50 Research and local engagement and data from the Crown Estate in the pre-consultation period for the sites considered for designation as part of the 2nd 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 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. 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 1st tranche of the sites included in that tranche. The same approach is being taken for the 2nd tranche. This methodology was agreed with MoD and updated costs for officers’ time were provided during the pre-consultation period. 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 off the MCZ from the coastline, the...
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 implementation and enforcement of management lies with the MMO.\(^78\)

7.54 For the proposed 2nd 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.\(^79\) 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), J NCC has responsibility for offshore sites (beyond 12nm) and they have joint responsibility for sites between 6 and 12nm. Estimates of costs of each site have been provided by the SNCBs 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.


\(^79\) MMO and IFCAs, pers. comm. 2014.

\(^80\) 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 27th 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 27th 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 2nd 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\(^8^1\), 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.

\(^8^1\) 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. 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. 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


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 2nd tranche, but may be considered as part of the 3rd 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 S NCB advice, the number of features in inshore MCZs going forward to designation as part of 2nd 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 2nd 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\(^{84}\) of 2nd Tranche Marine Conservation Zones

<table>
<thead>
<tr>
<th>Private Sector</th>
<th>Methodology, assumptions and sources</th>
<th>Best estimate scenario</th>
<th>Low / High cost scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate extraction</td>
<td>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.</td>
<td>£0.011m/yr</td>
<td>£0.003m/yr - £0.011m/yr</td>
</tr>
<tr>
<td>Aquaculture</td>
<td>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.</td>
<td>No anticipated costs</td>
<td>N/A</td>
</tr>
<tr>
<td>Cables</td>
<td>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 M CZs and scaled down proportionally for the sites in the preferred option. Increased cost to an operator of a additional assessment for environmental impact upon MCZ features (broad-scale habitats only) for one licence application for one future cable installation is estimated to be £10K based on estimates provided by industry.</td>
<td>£0.001m/yr</td>
<td>£0.001m/yr - £0.002m/yr</td>
</tr>
</tbody>
</table>

\(^{84}\) 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.

\(^{85}\) 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.
<table>
<thead>
<tr>
<th>Coastal Development</th>
<th>Known coastal developments mapped for each MCZ and assessed for potential impact on conservation objectives. No impacts or mitigation anticipated.</th>
<th>No anticipated costs</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Fisheries (UK)</td>
<td>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). Costs are due to management of some fishing activities. Gear types affected and management required are specific to the site and the feature which the MCZ is designated to protect. Management scenarios for each MCZ are summarised in Annex A. 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. 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.</td>
<td><strong>£0.034m/yr</strong></td>
<td><strong>£0.000m - £0.327m/yr</strong></td>
</tr>
<tr>
<td>Archaeological heritage</td>
<td>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 2nd 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.</td>
<td>No impact monetised.</td>
<td>N/A</td>
</tr>
<tr>
<td>Oil &amp; Gas &amp; other energy (including carbon capture and storage (CCS) at sea)</td>
<td>Current activity mapped (including 26th, 27th and 28th oil and gas licensing rounds and potential future oil &amp; 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</td>
<td><strong>£0.117m/yr</strong></td>
<td><strong>£0.112m/yr - £0.122m/yr</strong></td>
</tr>
</tbody>
</table>

Assumptions are the same for best-estimate apart from the number of future licence applications.

**Low cost scenario**: Oil & Gas: Number of future licence applications in blocks in the 26th Round

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86 See here for an explanation of the oil and gas licensing process: [https://www.gov.uk/guidance/oil-and-gas-licensing-rounds](https://www.gov.uk/guidance/oil-and-gas-licensing-rounds)
<table>
<thead>
<tr>
<th>Ports, Harbours, Commercial shipping and disposal sites</th>
<th>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.</th>
<th>£0.126m/yr</th>
<th>£0.124m/yr - £0.263m/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current activity mapped (i.e. ports, harbours, disposal sites and navigational edges). Details of known proposed future developments reviewed. Estimates provided by industry.</strong> This includes external costs for consultants (based on the average of two estimates from two UK environmental consultancy firms).</td>
<td><strong>Sensitivity around licence applicant and application numbers and mitigation requirements.</strong> <strong>Low cost scenario:</strong> Licence applications and applicants for disposal sites, required within 5km of MCZ (navigational dredging, disposal and future port developments) incur additional one-off costs. <strong>High cost scenario:</strong> 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 (for navigational dredging only). Site-specific mitigation costs were advised by NE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recreation**

Recreation activity in and near each MCZ was mapped as part of the Regional Project process. 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 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. | **No impact monetised** | N/A | |

87 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.
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.

See Annex A for indicative management scenarios at these sites.

**Renewable Energy**

Existing and planned activity was mapped against MCZs. Crown Estate and MMO provided information of potential future developments within the next 20 years. There are additional costs for licence applications for developments near MCZs, to assess the impact on MCZ broad scale habitats.

Information provided by stakeholders MMO, NE, Cefas and the Crown Estate has indicated no yet-to-be-consented renewables cables interact with the sites proposed for designation for the 2nd tranche, and no consultation responses raised any additional consented renewables cables.

The best estimate 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.

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 assessment costs per site depending on the number of broad scale habitats designated.

**Public Sector**

**Methodology, assumptions and sources**

Flood and coastal erosion risk management

No costs anticipated

No additional mitigation costs are anticipated as a result of 2nd tranche MCZs.

**Confidence: High**

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88 MMO, NE, Cefas and the Crown Estate, pers. comm. 2014.
<table>
<thead>
<tr>
<th>National Defence</th>
<th>National Defence activity in and near to all potential MCZs assessed. Costs provided by MoD. <strong>Confidence:</strong> Anticipated costs are generic and may differ depending on the scale and nature of the military activities in each MCZ.</th>
<th>£0.002m/yr</th>
<th>No sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs to public sector of managing MCZs (management and enforcement)</td>
<td>Costs were provided by local authorities, landowners, IFCA’s, 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). <strong>Confidence:</strong> Estimates don’t take account of possible cost savings of introducing one management measure that covers multiple MCZs or risk based prioritisation of monitoring.</td>
<td>£0.751m/yr</td>
<td>£0.709m/yr - £0.793m/yr</td>
</tr>
<tr>
<td>Ecological Surveys</td>
<td>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 onshore sites based on estimates provided by Natural England and applied to number of features in each site. <strong>Confidence:</strong> 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.</td>
<td>£1.063m/yr</td>
<td>£1.063m/yr - £1.753m/yr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-UK</th>
<th>Methodology and sources</th>
<th>Best estimate scenario</th>
<th>Low / High cost scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-UK commercial fisheries vessels</td>
<td>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.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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90 MoD, pers. comm. 2014/
These are not included in the summary figures or the EANCB calculation, but informed the site's election 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.
7.84 Costs to business have been calculated in line with the Better Regulation Framework manual\textsuperscript{91}. 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 IFCA, with consultation process and if required an associated regulatory IA. These costs are a best estimate of what costs may occur. Where the MMO or IFCA introduce regulatory measures and complete a regulatory Impact Assessment, the costs of these measures to business will be accounted for and assessed against the 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 other than 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.

\textit{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.

\textsuperscript{91} 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.

7.90 There is uncertainty in the displacement of fishing activity assumption. The full range of possibilities is not estimated 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 into the Impact Assessment, and this IA has incorporated evidence provided through the consultation on the 2nd 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. 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 that over 99% of commercial fishing enterprises in England and Wales had fewer than 10 full-time
equivalent employees in 2013, with the remainder having between 11 and 49 employees\textsuperscript{95}. 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\textsuperscript{st} tranche IA showed that there was a low degree of overlap with the entire suite of 127 MCZs; this IA only considers 2\textsuperscript{nd} tranche MCZs, of which only some are expected to be subject to management of fisheries.\textsuperscript{96}

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\textsuperscript{st} and 2\textsuperscript{nd} 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\textsuperscript{nd} tranche is minimal compared to the analysis that would be required in the baseline any way. No developments have been identified which would require mitigation.

\textsuperscript{95} 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.

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 defences, climate change mitigation). These can be described as ‘Ecosystem Service’ benefits. Ecosystem services are defined as services provided by the natural environment that benefit people97, 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)98 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)99. 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 2nd tranche MCZs.100 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 2nd 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 report101.

<table>
<thead>
<tr>
<th>General Ecosystem service categorisation</th>
<th>Final ecosystem services assessed in the IA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisioning</td>
<td>Food (wild, farmed)</td>
</tr>
<tr>
<td></td>
<td>Fish feed (wild, farmed, bait)</td>
</tr>
<tr>
<td></td>
<td>Fertiliser and biofuels</td>
</tr>
<tr>
<td></td>
<td>Ornaments and aquaria</td>
</tr>
<tr>
<td></td>
<td>Medicines and blue biotechnology</td>
</tr>
<tr>
<td>Regulating</td>
<td>Healthy Climate</td>
</tr>
<tr>
<td></td>
<td>Prevention of Coastal Erosion</td>
</tr>
<tr>
<td></td>
<td>Sea Defence</td>
</tr>
<tr>
<td></td>
<td>Waste burial / removal / neutralisation</td>
</tr>
<tr>
<td>Cultural</td>
<td>Tourism and nature watching</td>
</tr>
<tr>
<td></td>
<td>Spiritual and cultural well-being</td>
</tr>
<tr>
<td></td>
<td>Aesthetic benefits</td>
</tr>
</tbody>
</table>

100 http://www.valmer.eu/
101 http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=KLY76RakO%3d&tabid=82
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. 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 the 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.

<table>
<thead>
<tr>
<th>Provisioning</th>
<th>In 2012, the GVA of fishing, aquaculture, processing and preserving was £2.1bn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating</td>
<td>Prevention of coastal erosion and sea defence; Healthy Climate; Waste burial / removal / neutralisation</td>
</tr>
<tr>
<td>Cultural</td>
<td>Tourism and nature watching</td>
</tr>
</tbody>
</table>

Table 4: Existing monetized benefits of the UK marine environment

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103 UK National Ecosystem Assessment, 2011 from Fletcher et al (2012). Total value of service assuming it is present in all UK coastal wetland.
104 Beaumont et al., 2006
109 Nature faux-fee-fee
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. This equates to £1.65bn if multiplied by the estimated 22m households in England in 2012.

Notes of the table:
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).

Benefits under preferred option: Designate 23 MCZs

8.5 Designation of 23 MCZs and the additional features from the 1st 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 10,812km² will be protected by the designation of the 2nd 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 features 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.

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8.7 The different types of ecosystem service benefits expected to improve due to the 2nd tranche MCZ designation are summarised below. Where possible additional benefits from the 2nd 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\textsuperscript{110}. 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 2nd 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\textsuperscript{111} 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 2nd 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).

\textsuperscript{110} 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.

\textsuperscript{111} 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 2nd tranche

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Description</th>
<th>Quantification (where possible)</th>
<th>Certainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-use / bequest values</td>
<td>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); 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).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Based on Willingness to Pay estimates (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 £148m to £280m (Best estimate £214m) to protect 23 of the designated sites. Further explanation on the estimates is provided in Box 4, and Annex C.</td>
<td>Med - High confidence in existence of features High confidence that there will be a non-use benefit (welfare increase). Low confidence in the scale of the benefits.</td>
<td></td>
</tr>
<tr>
<td>Research and education</td>
<td>MCZ research and monitoring will support more effective marine planning and licensing in UK waters. The scale of research benefit depends on the scale of additional information gathered and the ability of information to enable better decisions to be made in the marine environment. There are specific research gaps in the effectiveness of MPAs in temperate areas and the role of biodiversity in ensuring the resilience of ecosystems and potential beneficial uses of marine species. Improvement in knowledge will support more effective marine planning and licensing in UK waters. Estuaries, rocky bottoms 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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Med - High confidence in existence of features; relatively high confidence that there will be a benefit to research and education due to these designations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish and shellfish for human consumption</td>
<td>Managing damaging activities and the resulting habitat and species recovery can lead to improvements in populations of fish and shellfish. There is evidence 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 to benefit 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</td>
<td>High confidence in existence of features; fairly high confidence in impact on provisioning services for shellfish; very low confidence in impact on provisioning services of fish.</td>
<td></td>
</tr>
</tbody>
</table>

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113 Derived from Kenter et al. 2013. Available here - http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUApHf%2bY%3d&tabid=82
114 Regional project Methodology Documents Annex H5 – could someone find this based on that reference – weblink is better (or year, who published etc.)
### Natural hazard protection

<table>
<thead>
<tr>
<th>Features in 5 sites</th>
<th>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.</th>
</tr>
</thead>
</table>
| Mudflats, estuarine habitats, intertidal habitats, coastal salt marshes, and coral reefs | Mudflats, estuarine habitats, intertidal habitats, coastal salt marshes, and coral reefs are all relevant habitats for fish.  
High confidence in existence of features; low confidence in impact on regulating services |

### Environmental resilience

<table>
<thead>
<tr>
<th>Features in 2 sites</th>
<th>Protecting a wide range of species and habitats can increase resilience to natural and human pressures. By protecting and enhancing biodiversity, MCZs will help 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, any of which will respond differently to natural or human pressures. There is additional benefit in protecting these features when the marine environment outside of MCZs is under additional pressures. Major threats to marine ecosystems are anticipated as a result of climate change, including rising sea temperatures, rising sea levels, greater frequency of storms, and changes in the timing of plankton production, composition, and distribution.</th>
</tr>
</thead>
</table>
| Mudflats, estuarine habitats, intertidal habitats, coastal salt marshes, and coral reefs | 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.  
High confidence in existence of features; medium confidence in impact on environmental resilience |

### Gas and climate regulation

<table>
<thead>
<tr>
<th>Features in 6 sites</th>
<th>Certain marine habitats are efficient sequesters of carbon and contribute to global climate regulation. Management of MCZs may reduce human pressures on these habitats that may result in net increases in the rate of carbon sequestration.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mudflats, estuarine habitats, intertidal habitats, coastal salt marshes, and coral reefs</td>
<td>In the 2nd tranche a number of features which are particularly efficient sequesters of carbon are: Intertidal mud, coastal salt marshes and saltine cord beds (mud in d deep w ater) and seagrass beds. Studies have valued the carbon benefit of certain relevant habitats in their entirety, for example, Beaumont et al (2010) valued saltmarshes at £6,100-62,200/km/yr. Andrews et al (2000) valued (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 CO2; converted to km2 for comparison with area of feature.</td>
</tr>
</tbody>
</table>

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115 Fletcher et al (2012)  
116 NEAFO 2013: http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=JEp3mJSVBw%3D&tabid=82  
118 OSPAR (2010)  
120 (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 CO2; converted to km2 for comparison with area of feature. http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=O%2B8It%2F5Zpg%3D&tabid=82
### 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. 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 carbon sequestration following designation of MCZs in the area.

| 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. 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 carbon sequestration following designation of MCZs in the area. | High confidence in existence of features; low confidence in impact on regulation of pollution. |

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122 http://www.valmer.eu/case-studies-overview/north-devon/122
124 http://www.valmer.eu/case-studies-overview/north-devon/124
8.12 The evidence presented in Table 5 shows that, as for the 1st tranche, implementation of the 2nd tranche and additional 1st 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. 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 December 2012 and January 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 at tributable 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 be benefits transfer, monetary (choice experiment and contingent valuation) and non-monetary valuation.

Based on their results per site (using contingent valuation method (CVM)), it is estimated that UK divers and anglers are willing to pay 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 absence of environmental goods of value. They considered motivation for paying this premium to be associated with three sources of non-use value: option value (the value of retaining the possibility of using a site in the future, including the value of avoiding irreversibility of harm); 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.

125 Kenter et al (2013), http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2bY%3d&tabid=82
126 Kenter et al (2013), http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2bY%3d&tabid=82
127 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 determines willingness to pay, rather than the actual specific risk to the object of value.
8.15 Discussing limitations of the non-use estimates the authors note there may be some framing bias in responses and that use of 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.\textsuperscript{129}

\textbf{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 M CZs designated in 1st 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, in including a range of representative habitats sites and enough spatial areas of for 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.\textsuperscript{130}

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 M CZs 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.

\textsuperscript{129} 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.

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 the 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 10,812km² 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 2nd 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).

### Table 6: Summary of additional costs for designating 23 MCZs

<table>
<thead>
<tr>
<th>Impacted Private Sector</th>
<th>Best Estimate Cost £m/yr (low - high)</th>
<th>Best estimate PV Costs £m (low - high)</th>
<th>Description of Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate extraction</td>
<td>0.011m/yr (0.003-0.011)</td>
<td>0.156m (0.037 - 0.156)</td>
<td>Licence application costs, to collect more information on impact on designated features. These costs are additional to the costs incurred for Tranche 1. Some costs associated with aggregates 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.</td>
</tr>
<tr>
<td>Aquaculture</td>
<td>No costs anticipated as a result of tranche 2</td>
<td>No costs anticipated as a result of tranche 2</td>
<td>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 2nd Tranche are maintain GMA and aquaculture does not require a licence.</td>
</tr>
<tr>
<td>Cables</td>
<td>0.001m/yr (0.001-0.002)</td>
<td>0.020m (0.010-0.031)</td>
<td>Licence application costs for future developments, to collect more information of impact on BSH. Mitigation</td>
</tr>
</tbody>
</table>

\(^{31}\) 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

<table>
<thead>
<tr>
<th>Non-monetised</th>
<th>Non-monetised</th>
<th>Description of Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.034m/yr (0.000-0.327)</td>
<td>0.496m (0.004-4.814)</td>
<td>Site and gear restrictions on fishing activities, for example restricting trawling in specific sections of an M CZ, where a particular feature is present. Costs are the best estimate of the range of management scenarios, with an assumption of 75% displacement. These are calculated as loss in Gross Value Added (GVA), as for all sectors. High scenario includes sensitivity of loss of all affected fishing GVA.</td>
</tr>
</tbody>
</table>

### Historic Environment

<table>
<thead>
<tr>
<th>Not possible to monetise</th>
<th>Not possible to monetise</th>
<th>Licence application costs, to collect more information on designated features. Site-specific potential non-monetised cost – where potential intrusive archaeological activity could be restricted where anchoring restrictions in place.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.117m/yr (0.112 – 0.122)</td>
<td>1.777m (1.675 – 1.878)</td>
<td></td>
</tr>
</tbody>
</table>

### Oil & Gas (including carbon capture storage at sea)

| 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. |
|--------------------------|--------------------------|--------------------------------------------------|
| 0.126m/yr (0.124 – 0.263) | 1.876m (1.853 – 3.890) | |

### Ports, harbours, Commercial shipping and disposal sites

| 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 |
|--------------------------|--------------------------|--------------------------------------------------|
| 0.010m/yr (0.010 – 0.012) | 0.177m (0.177 – 0.215) | |

### Recreation

| 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. |
|--------------------------|--------------------------|--------------------------------------------------|
| 0.300m/yr (0.250 – 0.738) | 4.502m (3.756 – 10.983) | |

<table>
<thead>
<tr>
<th>Total annual and PV costs to private sector</th>
<th>PV 2015 base year; 2013 prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.300m/yr (0.250 – 0.738)</td>
<td>4.502m (3.756 – 10.983)</td>
</tr>
</tbody>
</table>

### Impacted Public Sector

<p>| Environment Agency (for No costs anticipated No costs anticipated | Potential licence application costs to Environment Agency for any future |</p>
<table>
<thead>
<tr>
<th>Cost £/yr (low-high)</th>
<th>PV cost £m (low-high)</th>
<th>Description of Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>No costs anticipated</td>
<td>No costs anticipated</td>
<td></td>
</tr>
</tbody>
</table>

62
<table>
<thead>
<tr>
<th>National Defence</th>
<th>0.002m/yr</th>
<th>0.035m</th>
<th>Costs of adjusting electronic tools and charts and annual costs of maintaining; Additional planning considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs to public sector of managing MCZs</td>
<td>0.751m/yr (0.709 - 0.793)</td>
<td>11.078m (10.441 - 11.715)</td>
<td>Costs to MO, IFCA and Defra for enforcing management measures.</td>
</tr>
<tr>
<td>Ecological Surveys</td>
<td>1.063m/yr (1.063 - 1.753)</td>
<td>15.745m (15.745 - 25.996)</td>
<td>Costs of baseline surveys and costs of monitoring to JNCC and NE.</td>
</tr>
<tr>
<td><strong>Annual and PV costs to public sector</strong></td>
<td>1.816m/yr (1.774 - 2.548)</td>
<td>26.858m (26.221 - 37.745)</td>
<td></td>
</tr>
<tr>
<td><strong>Overall annual and PV costs</strong></td>
<td>2.116m/yr (2.024 - 3.286)</td>
<td>31.359m (29.977m - 48.729m)</td>
<td>Annualised total costs for public and private sector</td>
</tr>
</tbody>
</table>

**Notes:**
- The annual costs (m/yr) for each sector (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.

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.
References


Fletcher, S., Saunders, J., Herbert, R., Roberts, C., & Dawson, K. 2012 (a). Description of the Ecosystem Services Provided by Broad-scale Habitats and Features of Conservation Importance that are Likely to be Protected by Marine Protected Areas in the Marine Conservation Zone Project Area. Research report produced for Natural England. NECR088


http://www.wildlifetrusts.org/sites/default/files/Securing%20the%20benefits%20of%20MCZs.pdf


Risk and Policy Analysts, 2013. Value of the Impact of Marine Protected Areas on Recreation and Tourism Services, Case studies, Methodology and Literature Review report for Defra,


South West Tourism recreational workshop. Marine Protection Areas: Opportunities and challenges for tourism


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.

<table>
<thead>
<tr>
<th>Site</th>
<th>Management Scenarios</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allonby Bay</td>
<td>No additional management</td>
<td>All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.</td>
</tr>
</tbody>
</table>
| 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 (Palinurus elephas) 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 (Palinurus elephas) 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). |
<table>
<thead>
<tr>
<th>Site</th>
<th>Management Scenario 1: No additional management</th>
<th>Management Scenario 2: Closure of entire MCZ to bottom trawls and dredges (Stakeholder Recommendation)</th>
<th>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 &amp; traps, nets, hooks &amp; lines</th>
<th>Management Scenario 4: Closure of entire MCZ to bottom trawls, dredges, pots &amp; traps, nets, hooks &amp; lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulmar</td>
<td>No additional management</td>
<td>All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.</td>
<td>Multiple features are recover. Therefore a range of scenarios for all gear types is necessary to reflect uncertainty over management needed.</td>
<td></td>
</tr>
<tr>
<td>Greater Haig Fras</td>
<td>Management scenario 1: No additional management</td>
<td>Management scenario 2: Closure of entire MCZ to bottom trawls &amp; dredges (Stakeholder Recommendation)</td>
<td>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 &amp; traps, nets, hooks &amp; lines</td>
<td>Management scenario 4: Closure of entire MCZ to bottom trawls, dredges, pots &amp; traps, nets, hooks &amp; lines</td>
</tr>
<tr>
<td>Hartland Point to Tintagel</td>
<td>Management Scenario 1: No additional management</td>
<td>Management Scenario 2: Closure of entire MCZ to bottom trawls and dredges</td>
<td>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).</td>
<td></td>
</tr>
<tr>
<td>Holderness Inshore</td>
<td>No additional management</td>
<td>All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land's End (Runnel Stone)</td>
<td>No additional management</td>
<td>All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounts Bay</td>
<td>No additional management</td>
<td>All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newquay and The Gannel</td>
<td>No additional management</td>
<td>All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North-West Jones Bank</td>
<td>Management Scenario 1: No additional management</td>
<td>Management Scenario 2: Closure of entire MCZ to bottom trawls and dredges (Stakeholder Recommendation)</td>
<td>There are multiple features with a recover objective due to benthic trawling but these features are not assessed as being sensitive to static gears.</td>
<td></td>
</tr>
<tr>
<td>Offshore Brighton</td>
<td>Management Scenario 1: No additional management</td>
<td>Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots &amp; traps, nets, hooks &amp; lines</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Offshore Overfalls</td>
<td>Management Scenario 1: No additional management</td>
<td>Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots &amp; traps, nets, hooks &amp; lines</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Runswick Bay</td>
<td>No additional management</td>
<td>All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>Fisheries Management</td>
<td>Recreation Management</td>
<td>Fisheries Management</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>----------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>The Needles</td>
<td>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)</td>
<td>Voluntary anchoring code of practice over areas of sea grass</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>The Swale Estuary</td>
<td>No additional management</td>
<td></td>
<td>All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.</td>
<td></td>
</tr>
<tr>
<td>Utopia</td>
<td>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)</td>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>West of Walney including proposed Co-Location Zone</td>
<td>No additional management</td>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Western Channel</td>
<td>No additional management</td>
<td></td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Ecosystem Service Category and type of value</th>
<th>Study</th>
<th>Methodology</th>
<th>Key Findings</th>
<th>Impact Assessment Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation – Angling: Willingness to pay for improvement in angling experience</td>
<td>Drew Associates Limited (2004).</td>
<td>A choice experiment (CE) estimated the values associated with changes in the diversity and quality of the angling experience.</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
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</tr>
<tr>
<td>Recreational Angling: Willingness to Pay for improvement in quality of angling experience</td>
<td>Lawrence, K. (2005).</td>
<td><strong>Choice experiment</strong> 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.</td>
<td>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.</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>Non-use value of protection for English specific MCZs</td>
<td>Kenter et al. (2013)</td>
<td>Estimated using <strong>contingent valuation</strong> 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. A travel-cost based <strong>choice experiment</strong> was also conducted to estimate annual recreational values.</td>
<td>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.</td>
</tr>
<tr>
<td>Non-use value of protection (also likely to include some</td>
<td>McVittie, A. and D. Moran (2010).</td>
<td><strong>Choice experiment</strong> 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</td>
<td>1 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.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Use value relating to protection)</th>
<th>Hypothetical UK network of MCZs to ‘halt the loss of marine biodiversity’.</th>
<th>Resource extraction. Assuming there are 22 million households in England (English Housing Survey 2012) this equates to £1.5bn and £88m respectively.</th>
<th>The smaller number and area of proposed English MCZs not possibly to robustly disaggregate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>Willingness to pay to preserve the rocky intertidal zone in California through additional management of public access, through a contingent valuation questionnaire.</td>
<td>Respondents were willing to pay an additional $6 per visit to the coast to protect the coastline from further damage.</td>
<td>No 2013 MCZ could be considered to ‘protect coastline from damage’, therefore value not relevant.</td>
</tr>
<tr>
<td>Ressurreicao et al (2012).</td>
<td>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.</td>
<td>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)].</td>
<td>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.</td>
</tr>
<tr>
<td>Börger et al. (2014)</td>
<td>Choice experiment which estimated willingness to pay to protect an offshore habitat: the UK portion of the Dogger Bank.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Jobstvogt et al. (2014)</td>
<td>Choice experiment which estimated willingness to pay for additional marine protected areas in the Scottish deep-sea.</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>
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

As part of the National Ecosystem Assessment Follow On project (NEAFO), 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, 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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1 Kenter et al. (2013) http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2BY%3D&tabid=82
3 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. 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 e-mail 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 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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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.) as summed 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). 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 that 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 as sociated 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 different instruments, CE and CVM, is fundamentally different, as a result of 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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5 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 MPA and the value of protecting the MPA
- 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)
  - 22 of 35 proposed Scottish sites (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. 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. 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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6 Sites at a depth of over 100m were excluded from the full list of English rMCZs and Scottish rMPAs.
7 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.
8 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.
submission/responses; 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 (although budget constraints were emphasised in the survey).

The report also looks at restriction scenarios where the sites are completely closed to specific activities. 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. 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 estimates. 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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9 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.


11 no potting and gillnetting; no anchoring or mooring; no dredging and trawling

12 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)

<table>
<thead>
<tr>
<th>Site name</th>
<th>Total (aggregate value from divers and anglers; £)</th>
<th>Total (adjusted to 2013 prices; £)</th>
<th>Best estimate (adjusted to 2013 prices; £)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Allonby Bay</td>
<td>4,347,000</td>
<td>7,808,000</td>
<td>6,078,000</td>
</tr>
<tr>
<td>Bideford to Foreland Point</td>
<td>10,019,000</td>
<td>20,956,000</td>
<td>15,487,500</td>
</tr>
<tr>
<td>Coquet to St Mary’s</td>
<td>8,902,000</td>
<td>15,973,000</td>
<td>12,437,500</td>
</tr>
<tr>
<td>Cromer Shoal Chalk Beds</td>
<td>7,808,000</td>
<td>14,033,000</td>
<td>10,920,500</td>
</tr>
<tr>
<td>Dover to Deal</td>
<td>7,636,000</td>
<td>13,712,000</td>
<td>10,674,000</td>
</tr>
<tr>
<td>Dover to Folkestone</td>
<td>8,993,000</td>
<td>16,169,000</td>
<td>12,581,000</td>
</tr>
<tr>
<td>Farnes East</td>
<td>4,207,000</td>
<td>8,703,000</td>
<td>6,455,000</td>
</tr>
<tr>
<td>Fulmar²</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Greater Haig Fras³</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes:
1. Low and High values represent the range of non-use values for divers and anglers.
2. Best Estimate values are the central estimates.
3. Adjusted values are calculated to 2013 prices.
4. Management scenarios include restrictions on fishing activities.

*References for specific management scenarios are included for clarity.*
<table>
<thead>
<tr>
<th>Site name</th>
<th>Potential management scenarios for fisheries</th>
<th>Total (aggregate value from divers and anglers; £)</th>
<th>Best Estimate (£)</th>
<th>Total (adjusted to 2013 prices; £)</th>
<th>Best estimate (adjusted to 2013 prices; £)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hartland Point to Tintagel</td>
<td>Management scenario 1: No additional management&lt;br&gt;Management Scenario 3: Closure of entire rMCZ to bottom trawls, dredges</td>
<td>9,703,000 19,728,000</td>
<td>14,715,500</td>
<td>9,853,763 20,034,528</td>
<td>14,944,145</td>
</tr>
<tr>
<td>Holderness Inshore</td>
<td>No additional management</td>
<td>6,876,000 12,352,000</td>
<td>9,614,000</td>
<td>6,982,837 12,543,922</td>
<td>9,763,380</td>
</tr>
<tr>
<td>Land's End</td>
<td>No additional management (Stakeholder recommendation)</td>
<td>6,440,000 11,565,000</td>
<td>9,002,500</td>
<td>6,540,063 11,744,694</td>
<td>9,142,378</td>
</tr>
<tr>
<td>Mounts Bay</td>
<td>No additional management (Stakeholder Recommendation)</td>
<td>8,587,000 15,457,000</td>
<td>12,022,000</td>
<td>8,720,422 15,697,167</td>
<td>12,208,795</td>
</tr>
<tr>
<td>Newquay and The Gannel</td>
<td>No additional management</td>
<td>7,255,000 13,045,000</td>
<td>10,150,000</td>
<td>7,367,726 13,247,690</td>
<td>10,307,708</td>
</tr>
<tr>
<td>North-West Jones Bank a</td>
<td>Management scenario 1: No additional management&lt;br&gt;Management scenario 2: Closure of rMCZ to bottom trawls &amp; dredges (Stakeholder Recommendation)</td>
<td>0 0</td>
<td>0</td>
<td>0 0</td>
<td>0 0</td>
</tr>
<tr>
<td>Offshore Brighton</td>
<td>Management scenario 1: No additional management&lt;br&gt;Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots &amp; traps, nets, hooks &amp; lines</td>
<td>4,811,000 10,231,000</td>
<td>7,521,000</td>
<td>4,885,752 10,389,966</td>
<td>7,637,859</td>
</tr>
<tr>
<td>Offshore Overfalls</td>
<td>Management scenario 1: No additional management&lt;br&gt;Management scenario 2: Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (SNCB informed scenario)</td>
<td>5,440,000 11,508,000</td>
<td>8,474,000</td>
<td>5,524,525 11,686,808</td>
<td>8,605,667</td>
</tr>
<tr>
<td>Runswick Bay</td>
<td>No additional management</td>
<td>6,235,000 11,199,000</td>
<td>8,717,000</td>
<td>6,331,878 11,373,007</td>
<td>8,852,442</td>
</tr>
<tr>
<td>The Needles</td>
<td>Management scenario 1: Zoned closure of rMCZ to bottom trawls and dredges</td>
<td>9,478,000 17,523,000</td>
<td>13,500,500</td>
<td>9,625,267 17,795,268</td>
<td>13,710,267</td>
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<td>Site name</td>
<td>Potential management scenarios for fisheries</td>
<td>Total (aggregate value from divers and anglers; £)</td>
<td>Best Estimate (£)</td>
<td>Total (adjusted to 2013 prices; £)</td>
<td>Best estimate (adjusted to 2013 prices; £)</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------</td>
<td>-------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>The Swale Estuary</td>
<td>Management scenario 2: Closure of rMCZ to bottom trawls, dredges, nets, lines, pots and traps (SNCB informed scenario).</td>
<td>9,355,000</td>
<td>16,836,000</td>
<td>9,500,355</td>
<td>17,097,593</td>
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<tr>
<td>Utopia</td>
<td>No additional management</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>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).</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Management scenario 2: Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (Statutory Nature Conservation Bodies informed scenario).</td>
<td>9,260,000</td>
<td>17,084,000</td>
<td>9,403,879</td>
<td>17,349,447</td>
</tr>
<tr>
<td>West of Walney including proposed Co-Location Zone</td>
<td>Management scenario 1: No additional management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots &amp; traps, nets, hooks &amp; lines.</td>
<td>6,167,000</td>
<td>13,007,000</td>
<td>6,262,821</td>
<td>13,209,099</td>
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<tr>
<td>Western Channel</td>
<td>Management scenario 1: No additional management</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Management scenario 2: Closure of entire rMCZ to bottom trawls, and dredges</td>
<td>4,369,000</td>
<td>9,040,000</td>
<td>4,436,884</td>
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<td><strong>TOTAL</strong></td>
<td></td>
<td>148,154,768</td>
<td>280,216,310</td>
<td>214,185,539</td>
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</tbody>
</table>

Note:  
a 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.
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. 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 second 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  | 0.000  | 0.031  | 0.013  | 0.221  | 0.011  |
| Total (£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  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.221  | 0.011  |
| Present Value Costs (£m) | 0.000  | 0.000  | 0.052  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.038  | 0.000  | 0.035  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.156  | 0.008  |

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 uprated 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 second 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.

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1 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 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.055 | 0.003 |
| Total (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.055 | 0.003 |
| Present Value Costs (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.037 | 0.002 |

**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 2nd 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 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.030 | 0.001 |
| Total (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.030 | 0.001 |
| Present Value Costs (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.000 | 0.000 | 0.000 | 0.004 | 0.020 | 0.001 |

**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 uprated 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 2nd 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 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.004 | 0.015 | 0.001 |
| Total (£m) | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.004 | 0.015 | 0.001 |
| Present Value Costs (£m) | 0.000 | 0.000 | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.002 | 0.010 | 0.001 |

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 2nd 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 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.011 | 0.045 | 0.002 |
| Total (£m) | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.011 | 0.045 | 0.002 |
| Present Value Costs (£m) | 0.000 | 0.000 | 0.000 | 0.010 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.006 | 0.000 | 0.000 | 0.006 | 0.031 | 0.002 |

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 (Total £m) | 2016 (Total £m) | 2017 (Total £m) | 2018 (Total £m) | 2019 (Total £m) | 2020 (Total £m) | 2021 (Total £m) | 2022 (Total £m) | 2023 (Total £m) | 2024 (Total £m) | 2025 (Total £m) | 2026 (Total £m) | 2027 (Total £m) | 2028 (Total £m) | 2029 (Total £m) | 2030 (Total £m) | 2031 (Total £m) | 2032 (Total £m) | 2033 (Total £m) | 2034 (Total £m) | Total (Total £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 | 0.034 | Total (£m) |
| Total (£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 | 0.034 | Annual Average (£m) |
| Present Value Costs (£m) | 0.034 | 0.033 | 0.031 | 0.030 | 0.029 | 0.028 | 0.027 | 0.026 | 0.025 | 0.024 | 0.023 | 0.022 | 0.021 | 0.020 | 0.019 | 0.018 | 0.018 | 0.018 | 0.018 | 0.018 | 0.018 | 0.018 |

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. Fishing revenues for each site where sense checked with local IFICAs 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

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The 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  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Total (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Present Value Costs (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

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 | 0.327 | 0.327 |
| Total (£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 | 0.327 | 0.327 |
| Present Value Costs (£m) | 0.327 | 0.316 | 0.305 | 0.295 | 0.285 | 0.276 | 0.266 | 0.257 | 0.249 | 0.240 | 0.232 | 0.224 | 0.217 | 0.209 | 0.202 | 0.195 | 0.189 | 0.182 | 0.176 | 0.170 | 4.814 | 0.241 |

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.

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3 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

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<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
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<th>2032</th>
<th>2033</th>
<th>2034</th>
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<td>1.906</td>
<td>0.095</td>
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<tr>
<td>Total (£m)</td>
<td>0.203</td>
<td>0.000</td>
<td>0.000</td>
<td>0.049</td>
<td>0.011</td>
<td>0.000</td>
<td>0.000</td>
<td>0.049</td>
<td>0.000</td>
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<tr>
<td>Present Value Costs (£m)</td>
<td>0.203</td>
<td>0.000</td>
<td>0.000</td>
<td>0.044</td>
<td>0.010</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.006</td>
<td>1.777</td>
<td>0.089</td>
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</table>

The methodology developed for this IA\(^5\) 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 2nd 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):

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\(^5\) [http://publications.naturalengland.org.uk/publication/1940011](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 26th 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, it is estimated that there are no oil and gas blocks in licensed oil and gas blocks awarded in the 26th round with discovery or fallow where an MCZ is the nearest environmentally sensitive area, and therefore there are no costs for blocks in the 26th round which are awarded with discovery or fallow. The estimated number of oil and gas applications in licenced 26th 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 x 99) = £0.812m 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 26th round are proposed for designation as part of second tranche. The costs of additional assessment in the 26th round therefore total £0.203m (£0.812m*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 x 50% / 4 = 22 decommissions in each of those years. This results in £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 + £0.021m + £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 26th 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 x 25.0% = £0.049m in 2018, 2022, 2026, and 2030.

In the 27th and 28th 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 27th round blocks on offer which give additional acreage compared to acreage in the 26th round where an MCZ is the nearest environmentally sensitive area resulting in costs of £0.010m x 717 = £7.351m 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 27th round are proposed for designation as part of second tranche. The results in costs of £7.351m x 25.4% = £1.906m in 2024.

There are 52 28th round blocks on offer which give additional acreage compared to acreage in the 26th 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 28th round and so there are no attributable costs to the second tranche from the 28th round of oil and gas licensing.

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6 GIS data available here: https://www.gov.uk/oil-and-gas-licensing-rounds
7 Cost per application is £8,202 resulting in a higher total when multiplied up.
8 Cost per application is £10,252 resulting in a higher total when multiplied up.
| 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 26th 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 | 0.101 | 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 | 0.049 | 0.000 | 0.000 | 0.049 | 0.000 | 0.000 | 0.049 | 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 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.011 | 0.000 | 0.011 | 0.045 | 0.002 |
| **Additional costs to future applications in Licensed 27th and 28th Round Blocks (£m)** | 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 | 0.000 | 1.906 | 0.095 |
| **Total (£m)** | 0.101 | 0.000 | 0.000 | 0.049 | 0.011 | 0.000 | 0.000 | 1.917 | 0.000 | 0.049 | 0.000 | 0.011 | 0.000 | 0.049 | 0.011 | 0.049 | 0.000 | 0.000 | 0.000 | 0.000 | 2.247 | 0.112 |
| **Present Value Costs (£m)** | 0.101 | 0.000 | 0.000 | 0.044 | 0.010 | 0.000 | 0.000 | 1.407 | 0.000 | 0.033 | 0.000 | 0.000 | 0.007 | 0.029 | 0.000 | 0.000 | 0.067 | 0.000 | 0.000 | 0.000 | 1.675 | 0.084 |

Assumptions: Estimates related to decommissioning, CCS, 27th and 28th 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\(^{10}\). This is scaled down by a factor of 25.0% for the second tranche = £0.101m in 2015.

\(^{10}\) 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) |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|---------------------|
| Total  | 0.304| 0.000| 0.000| 0.049| 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| 2.450 | 0.122    |
| Present Value Costs (£m) | 0.304 | 0.000 | 0.000 | 0.044 | 0.010 | 0.000 | 0.000 | 0.038 | 0.000 | 1.407 | 0.000 | 0.033 | 0.000 | 0.007 | 0.029 | 0.000 | 0.000 | 0.000 | 0.006 | 1.878 | 0.094  |

| Additional costs to future applications in Licensed 26th 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 | 0.304 | 0.015 |
| Additional costs to future CCS apps. (£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 | 0.195 | 0.010 |
| Additional costs to decommissioning licences (£m) | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.045 | 0.002 |
| Additional costs to future applications in Licensed 27th and 28th Round Blocks (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.049 | 0.000 | 1.906 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.906 | 0.095 |

Assumptions: Estimates related to decommissioning, CCS, 27th and 28th 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\(^2\). This is scaled down by a factor of 25.0% for the second tranche = £0.304m in 2015.

\(^2\) Cost per application is £8,202 resulting in a higher total when multiplied up.
## Ports and Harbours

### Ports and Harbours: Best Estimate

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<th>2031</th>
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<th>2034</th>
<th>Total (£m)</th>
<th>Annual Average (£m)</th>
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<td>One off Transitional costs to ports with a MDP (£m)</td>
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<td>0.069</td>
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<td><strong>Total (£m)</strong></td>
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<td>0.094</td>
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<td>0.120</td>
<td>0.108</td>
</tr>
</tbody>
</table>

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 license 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 2nd 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.13

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 2nd 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 2nd 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. comm. 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 2nd tranche.

13 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.
| 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 | 0.032 | 0.024 | 0.000 | 0.003 | 0.029 | 0.000 | 0.003 | 0.024 | 0.000 | 0.214 | 0.111 |
| Port Development Additional Licence Application Costs (£m) | 0.043 | 0.049 | 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 | 0.041 | 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 | 1.378 | 0.069 |
| Total (£m) | 0.202 | 0.124 | 0.115 | 0.136 | 0.110 | 0.113 | 0.134 | 0.110 | 0.118 | 0.134 | 0.115 | 0.113 | 0.134 | 0.110 | 0.113 | 0.139 | 0.110 | 0.113 | 0.134 | 0.110 | 2.487 | 0.124 |
| Present Value Costs (£m) | 0.202 | 0.119 | 0.107 | 0.122 | 0.096 | 0.095 | 0.109 | 0.086 | 0.090 | 0.098 | 0.082 | 0.077 | 0.089 | 0.070 | 0.070 | 0.083 | 0.063 | 0.063 | 0.072 | 0.057 | 1.853 | 0.093 |

Assumptions: Port development application costs and disposal licence 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 60% of ports within 5km (approximately 7 ports) have a cost of £0.009m = £0.061m with rounding\(^\text{14}\). 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\(^{nd}\) 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:

\(^{14}\) 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 | 0.020 | 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 | 0.041 | 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 | 0.041 | 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
| Total (£m) | 0.311 | 0.261 | 0.252 | 0.285 | 0.245 | 0.250 | 0.283 | 0.245 | 0.257 | 0.283 | 0.252 | 0.250 | 0.283 | 0.245 | 0.250 | 0.290 | 0.245 | 0.250 | 0.283 | 0.245 | 5.269 | 0.263
| Present Value Costs (£m) | 0.311 | 0.252 | 0.235 | 0.257 | 0.214 | 0.211 | 0.230 | 0.193 | 0.195 | 0.208 | 0.179 | 0.172 | 0.187 | 0.157 | 0.155 | 0.173 | 0.141 | 0.140 | 0.153 | 0.128 | 3.890 | 0.194

**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 2nd 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 | 0.000 | 0.067 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.195 | 0.010 |
| Total costs (£m) | 0.109 | 0.000 | 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 | 0.000 | 0.000 | 0.000 | 0.111 | 0.000 | 0.177 | 0.009 |
| Present Value Costs (£m) | 0.109 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.057 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

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. comm. 2014) indicates that no such developments overlap with sites proposed for the second 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 is 10.241 km², the average 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.

This results in 6 additional application costs in 2015 (£0.020m + £0.019m + £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 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.233 | 0.012 |
| Total 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 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.233 | 0.012 |
| Present Value Costs (£m) | 0.147 | 0.000 | 0.000 | 0.000 | 0.000 | 0.057 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.215 | 0.011 |
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

| 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 | 0.000 | 0.000 | 0.000 | 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 | 0.000 | 0.000 | 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 | 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 | 5.229 | 0.26145 |
| Total (£m) | 1.132 | 1.132 | 1.132 | 1.132 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 1.034 | 21.260 | 1.063 |
| Present Value Costs (£m) | 1.132 | 1.094 | 1.057 | 1.021 | 0.986 | 0.953 | 0.841 | 0.812 | 0.785 | 0.758 | 0.733 | 0.708 | 0.684 | 0.661 | 0.638 | 0.617 | 0.596 | 0.576 | 0.556 | 0.536 | 15.745 | 0.787 |

Assumptions: Natural England provided assumptions for the monitoring of inshore sites (within 6nm) for the 1st tranche impact assessment and confirmed that those assumptions are still valid for the 2nd 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 undertake 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 1st 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 1st 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 2nd 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.

| 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 | 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 | 0.000 | 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 | 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 | 0.374 | 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 |
| Total (£m) | 1.890 | 1.890 | 1.890 | 1.890 | 1.890 | 1.694 | 1.694 | 1.694 | 1.694 | 1.694 | 1.694 | 1.694 | 1.694 | 1.694 | 1.694 | 1.694 | 1.694 | 35.050 | 1.753 |
| Present Value Costs (£m) | 1.890 | 1.826 | 1.764 | 1.705 | 1.647 | 1.591 | 1.378 | 1.331 | 1.286 | 1.243 | 1.201 | 1.160 | 1.121 | 1.083 | 1.046 | 1.011 | 0.977 | 0.944 | 0.912 | 0.881 | 25.996 | 1.300 |

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 1st 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 1st tranche sites) / 6 = £0.374m 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 | 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 | 12.898 | 0.645 |
| **Total (£m)** | 0.871 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 0.744 | 15.016 | 0.751 |
| **Present Value Costs (£m)** | 0.871 | 0.719 | 0.695 | 0.671 | 0.649 | 0.627 | 0.606 | 0.585 | 0.565 | 0.546 | 0.528 | 0.510 | 0.493 | 0.476 | 0.460 | 0.444 | 0.429 | 0.415 | 0.401 | 0.387 | 11.078 | 0.554 |

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

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**Assumptions:** Costs to IFCAs have been supplied by each ICA in different regions or average assumptions have been used where individual IFCAs have not supplied information (provided by MMO) for the Regional Projects and figures updated in the summer 2014 for the 2nd 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 IFCAS 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\textsuperscript{nd} 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\textsuperscript{nd} 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

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
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<th>2029</th>
<th>2030</th>
<th>2031</th>
<th>2032</th>
<th>2033</th>
<th>2034</th>
<th>Total (£m)</th>
<th>Annual Average (£m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFCA Implementation Costs (Transitional) (£m)</td>
<td>0.137</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.137</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>IFCA implementation + enforcement of commercial fisheries management measure costs &lt;6nm (£m)</td>
<td>0.127</td>
<td>0.127</td>
<td>0.127</td>
<td>0.127</td>
<td>0.127</td>
<td>0.127</td>
<td>0.127</td>
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<td>0.127</td>
<td>0.127</td>
<td>2.549</td>
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<tr>
<td>Defra and MMO Implementation Costs (Transitional) (£m)</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.049</td>
<td>0.002</td>
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<tr>
<td>MMO enforcement of commercial fisheries &gt;6nm and recreation management measure costs (£m)</td>
<td>0.656</td>
<td>0.656</td>
<td>0.656</td>
<td>0.656</td>
<td>0.656</td>
<td>0.656</td>
<td>0.656</td>
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<td>0.656</td>
<td>0.656</td>
<td>13.127</td>
<td>0.656</td>
<td></td>
</tr>
</tbody>
</table>
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 2nd 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 by-laws). Annual IFCA enforcement costs are estimated at £0.127/m 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

#### National: Best Estimate (also low and high cost estimate as no sensitivity)

| 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 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 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 | 0.002 | 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 |
| Total (£m) | 0.007 | 0.003 | 0.003 | 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 | 0.045 | 0.002 |
| Present Value Costs | 0.007 | 0.003 | 0.003 | 0.002 | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.035 | 0.002 |
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).
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. 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 the 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.

### Table: Baseline Annual Non-UK Revenues and Data Source(s) (£m/yr 2009-2013 average unless otherwise stated)

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

1 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.

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

3 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.

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

5 Where gear type is not known or it is classed as ‘mobile’ it is assumed bottom abrading for the purposes of the IA.
<table>
<thead>
<tr>
<th>Location</th>
<th>Revenue (EUR million)</th>
<th>Source and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>0.008 (Bottom Trawls) ; 0.004 (Purse Seines)</td>
<td>Source: DTU Aqua, 2014</td>
</tr>
<tr>
<td>Germany</td>
<td>0.001 (Mid Water Otter Trawl)</td>
<td>Source: Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung), 2014</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.029 (Bottom Trawls); 0.003 (All Other Gear Types)</td>
<td>Source: IMARES, part of Wageningen UR, 2014</td>
</tr>
<tr>
<td><strong>Total Revenue from Bottom Abrading Gears:</strong></td>
<td>0.042</td>
<td></td>
</tr>
<tr>
<td><strong>Total Non-UK Revenue:</strong></td>
<td>0.050</td>
<td></td>
</tr>
<tr>
<td>Greater Haig Fras</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>0.216 (Bottom Abrading Mobile); 0.021 (Static); 0.001 (Pelagic Trawl)</td>
<td>Source: Marine Institute Ireland, 2014</td>
</tr>
<tr>
<td>Spain</td>
<td>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</td>
<td>Source: Secretaría General de Pesca, 2014 and Cefas (pers. comm. 2014)</td>
</tr>
<tr>
<td><strong>Total Revenue from Bottom Abrading Gears:</strong></td>
<td>1.531</td>
<td></td>
</tr>
<tr>
<td><strong>Total Non-UK Revenue:</strong></td>
<td>1.553</td>
<td></td>
</tr>
<tr>
<td>North-West of Jones Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>0.223 (Mobile Gear, 2012-2013 data)</td>
<td>Source: Direction des Pêches Maritimes et de l’ Aquaculture, 2014</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.311 (Bottom Abrading Mobile); 0.001 (Pelagic Trawl)</td>
<td>Source: Marine Institute Ireland, 2014</td>
</tr>
<tr>
<td>Spain</td>
<td>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</td>
<td>Source: Secretaría General de Pesca, 2014 and Cefas (pers. comm. 2014)</td>
</tr>
<tr>
<td><strong>Best Estimate:</strong></td>
<td>0.193 (0.000 – 1.552)</td>
<td>dependent on management decisions and ability to displace</td>
</tr>
</tbody>
</table>

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6 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.

7 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.

8 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.
<table>
<thead>
<tr>
<th>Location</th>
<th>Total Revenue from Bottom Abrading Gears</th>
<th>Total Non-UK Revenue</th>
<th>Best Estimate</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.534</td>
<td>0.535</td>
<td></td>
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</tr>
<tr>
<td>Belgium</td>
<td>0.023 (Bottom Trawls); 0.005 (Scottish Seines)</td>
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<tr>
<td>Denmark</td>
<td>0.016 (Pelagic Trawl)</td>
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<tr>
<td>France</td>
<td>0.347 (bottom trawls / dredges, 2012-2013 data); 0.012 (Mid-water trawl, 2012-2013 data)</td>
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<td></td>
<td></td>
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<tr>
<td>Germany</td>
<td>0.123 (Mid Water Otter Trawl)</td>
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</tr>
<tr>
<td>Netherlands</td>
<td>0.007 (Bottom Trawls/ Dredges); 0.282 (Static); 0.261 (Mid Water Trawls)</td>
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<tr>
<td>Offshore Brighton</td>
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<td>(0.000 – 0.659)</td>
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<tr>
<td>Best Estimate: 0.065 (0.000 – 0.659)</td>
<td>dependent on management decisions and ability to displace</td>
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<tr>
<td>Offshore Overfalls</td>
<td>0.494</td>
<td>0.525</td>
<td>0.062</td>
<td>(0.000 - 0.494)</td>
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<tr>
<td>Belgium</td>
<td>0.038 (Bottom Trawls)</td>
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<tr>
<td>Denmark</td>
<td>0.003 (Pelagic Trawl)</td>
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</tr>
<tr>
<td>France</td>
<td>0.456 (Bottom Trawls / Dredges, 2012-2013 data); 0.017 (Mid-water trawl, 2012-2013 data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>0.011 (Mid Water Otter Trawl)</td>
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<tr>
<td>Offshore Overfalls</td>
<td>0.062</td>
<td></td>
<td>(0.000 - 0.494)</td>
<td></td>
</tr>
<tr>
<td>Best Estimate: 0.062 (0.000 - 0.494)</td>
<td>dependent on management decisions and ability to displace</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>West of Walney including proposed co-location zone</td>
<td>0.041</td>
<td></td>
<td>0.005</td>
<td>(0.000 - 0.041)</td>
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<tr>
<td>Belgium</td>
<td>0.017 (Bottom Trawls)</td>
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<tr>
<td>Denmark</td>
<td>0.044 (Pelagic Trawl)</td>
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<tr>
<td>Ireland</td>
<td>0.024 (Otter Trawl)</td>
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<tr>
<td>West of Walney including proposed co-location zone</td>
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<td></td>
<td>(0.000 - 0.041)</td>
<td></td>
</tr>
<tr>
<td>Best Estimate: 0.005 (0.000 - 0.041)</td>
<td>dependent on management decisions and ability to displace</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Source</td>
<td>2012-2013 Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------------------------------</td>
<td>-----------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Channel</td>
<td>Belgium: 0.002 (Bottom Trawls) Source: Departement Landbouw en Visserij, 2014</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>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</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Germany: 0.035 (Mid Water Otter Trawl) Source: Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung), 2014</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Ireland: 0.012 (Pelagic Trawl) Source: Marine Institute Ireland, 2014</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Netherlands: 0.001 (Bottom Trawls/ Dredges); 0.012 (Static); 0.067 (Mid Water Trawl) Source: IMARES, part of Wageningen UR, 2014</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>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)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Revenue from Bottom Abrading Gears:</strong> 2.449 <strong>Total Non-UK Revenue:</strong> 2.618</td>
<td>Best Estimate: 0.306 (0.000 - 2.449) dependent on management decisions and ability to displace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Applicable Tranche 2 sites</td>
<td><strong>Total Revenue Bottom Abrading Gears:</strong> 5.470 <strong>Total Non-UK Revenue:</strong> 6.714</td>
<td>Best Estimate: 0.697 (0.000 – 5.731) dependent on management chose and ability to displace</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 1st 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 km². 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 km². 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 km². 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 km². 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 km². 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 partially separate estuary areas on the south coast of Cornwall and protects a total area of 2 km². 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 km². 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 km². 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 km². 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 km². 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 TRANCH**

Recommended sites for the 2nd 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 km². 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 km². 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 km². 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 km². 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 km². 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 km². 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 km². 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 km². The site protects a wide range of features in intertidal and subtidal habitats and replicates for Rossworm reef, intertidal
underboulder communities and will contribute to the percentage protection of subtidal course sediment.

The Dover to Folkestone site has an area of 20 km². 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 km². 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 km². 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 dr edge di sposal appl ications. T he c ost t o U K fishing is £4. 9k pe r y ear, w ith 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 km². The site covers an area of bedrock and large boulders hosting rich communities of sponges, anthozoans, hydroids and br yozoans. 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 km². 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 edges 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 km². 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 km². 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 km². 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 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 km². 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 km². 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 km², 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 estimated costs for the site are £1.0k per year to the renewables 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 km² 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 km² 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 388km². 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 39km². 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 M CZ, and with the renewables sector of £0.9k per annum in relation to additional assessment for a proposed tidal lagoon.
Title: Designation of the third tranche of Marine Conservation Zones

**IA No:** Defra/MAR/008

**RPC Reference No:** RPC17-DEFRA-4197(2)

**Lead department or agency:** Department for Environment, Food & Rural Affairs

**Other departments or agencies:** Impact Assessment (IA)

**Date:** 15/02/2018

**Stage:** Final

**Source of intervention:** Domestic

**Type of measure:** Secondary legislation

**Contact for enquiries:** Sophie Vickery (Sophie.Vickery@defra.gov.uk)

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### Summary: Intervention and Options

#### Cost of Preferred (or more likely) Option (in 2016 prices)

<table>
<thead>
<tr>
<th>Total Net Present Social Value</th>
<th>Business Net Present Value</th>
<th>Net cost to business per year</th>
<th>Business Impact Target Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>£70.6m</td>
<td>£9.9m</td>
<td>£0.7m</td>
<td>Non-Qualifying provision</td>
</tr>
</tbody>
</table>

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

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

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

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

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

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

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

#### Will the policy be reviewed?

Will be reviewed. If applicable, set review date: 12/2024

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

Signed by the responsible SELECT SIGNATORY: ________________________ Date: ______________________
### Summary: Analysis & Evidence Policy Option 1

**Description:**

FULL ECONOMIC ASSESSMENT

<table>
<thead>
<tr>
<th>Price Base Year</th>
<th>Net Benefit (Present Value (PV)) (£m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>Low: -106.3</td>
</tr>
<tr>
<td></td>
<td>High: -60.3</td>
</tr>
<tr>
<td></td>
<td>Best Estimate: -70.6</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Description and scale of key monetised costs by ‘main affected groups’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best estimate average annual costs (undiscounted including transitional one-off costs): £4.792m. This includes industry costs arising from additional management measures and environmental assessments totalling £0.671m, comprising of annual costs to: commercial fisheries (£0.114m); ports and harbours (£0.117m); recreation (£0.287m); oil and gas (£0.140m); renewable energy (£0.005m); aggregate extraction (£0.006m); &amp; cables (£0.002m), and annual public costs totalling £4.121m, comprising: ecological surveys (£2.460m); management (£1.658m); &amp; national defence (£0.003).</td>
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<table>
<thead>
<tr>
<th>Description and scale of key non-monetised costs by ‘main affected groups’</th>
</tr>
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<tbody>
<tr>
<td>For sectors where the level of activity is expected to be small, or the occurrence of future projects is not predictable (e.g. archaeology), and/or where there is high level of uncertainty on future impacts and management required (e.g. aquaculture), costs have not been quantified. It has also not been possible to quantify impacts on local communities (as distinct from business) from the restriction and/or management of fisheries. Some public sector costs, such as: costs to inform users about MCZs, or advice to public authorities on impacts of proposed licensed activities on MCZs, and other costs to the public authorities following the advice, have not been monetised, as these responsibilities will be carried out under existing licensing and planning activities. Hence these costs are included as part of the business as usual scenario.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description and scale of key monetised benefits by ‘main affected groups’</th>
</tr>
</thead>
<tbody>
<tr>
<td>A number of substantial expected benefits arising from the designation of the third tranche of MCZs have been monetised for illustrative purposes within this IA to demonstrate the importance and value of the designation of these sites. Due to uncertainty around the magnitude of benefits calculated, they have not been included in the summary sheets and hence they have not been compared with the costs of designation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other key non-monetised benefits by ‘main affected groups’</th>
</tr>
</thead>
<tbody>
<tr>
<td>A combined area of approximately 4,522 mi² will be protected by the designation of the third tranche of MCZs (bringing the total area of MCZ protection to over 12,355 mi²) and 200 features (including features to be added to existing sites) will be covered. This protection will result in increased benefits supplied by ecosystem services and their components, such as increases in provisioning (e.g. fish and shellfish provision), regulating (e.g. climate regulation), supporting (e.g. nutrient cycling) and other cultural and recreational services. An ecologically coherent network of MPAs will also afford additional benefits, such as the conservation of marine and coastal biodiversity and will help the recovery of depleted stocks of exploited species.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>BUSINESS ASSESSMENT (Option 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct impact on business (Equivalent Annual) £m:</td>
</tr>
<tr>
<td>Costs: 0.7</td>
</tr>
</tbody>
</table>
List of acronyms
AT – Angling Trust
BEIS - Department for Business, Energy & Industrial Strategy (formerly DECC, the Department for Energy & Climate Change)
BMAPA – British Marine Aggregate Producers Association
BSAC – British Sub Aqua Club
BSH – Broad Scale Habitat
CCS – Carbon Capture and Storage
CEFAS – Centre for Environment, Fisheries and Aquaculture Science
CFP – Common Fisheries Policy
CVM – Contingent Valuation Method
DEFRA – Department for the Environment, Food and Rural Affairs
EANCB – Estimated Annual Net Cost to Business
EIA – Environmental Impact Assessment
EU – European Union
FCERM – Flood and Coastal Erosion Risk Management
GMA – General Management Approach
GVA - Gross Value Added
IA – Impact Assessment
ICES – International Council for the Exploration of the Seas
IFCA - Inshore Fisheries and Conservation Authority
JNCC - Joint Nature Conservation Committee
MCAA – Marine and Coastal Access Act 2009
MCZ – Marine Conservation Zone
MESAT – Maritime Environmental Sustainability Appraisal Tool
MMO – Marine Management Organisation
MoD – Ministry of Defence
MPA – Marine Protected Area
OSPAR – Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
PV – Present Value
RAMSAR sites - marine components of Ramsar sites. Sites designated as Wetlands of International Importance under the Ramsar Convention (1971)
RPC – Regulatory Policy Committee
RYA – Royal Yachting Association
SAC - Special Areas of Conservation
SNCB – Statutory Nature Conservation Body (collective term for Natural England and the Joint Nature Conservation Committee)
SPA - Special Protection Areas
SSSIs - Sites of Special Scientific Interest
UKMMAS - UK Marine Monitoring and Assessment Strategy
VMS – Vessel Monitoring System, used to track the location of vessels
WFD – Water Framework Directive
1. Policy background

1.1. With a mainland coastline of over 11,000 miles, the UK has a large marine area rich in marine life and natural resources. The UK’s seas are not only important in terms of biological diversity, but they also provide us with a variety of goods and services such as recreation and tourism opportunities (and associated income and wellbeing), the provision of marine products (e.g. fish and shellfish), and certain “regulating” services (e.g. climate regulation, flood mitigation and prevention of coastal erosion). This makes the marine environment essential to our social, economic and environmental well-being.

1.2. To deliver the vision of ‘clean, healthy, safe, productive, and biologically diverse oceans and seas’, as set out in the 25 Year Environment Plan¹ and the UK Marine Policy Statement², the Government and Devolved Administrations have committed to contributing to an ecologically coherent network of well-managed Marine Protected Areas (MPAs). The UK’s MPA network will also contribute to fulfilling international commitments such as the Oslo and Paris Convention for the Protection of the North East Atlantic (OSPAR³), and the Convention on Biological Diversity⁴.

1.3. The UK’s network will protect rare, threatened and nationally important habitats, species and geological features, with enough sites to conserve a range of major features vital for the health of our marine ecosystems. The network will be comprised of Special Protection Areas (SPAs)⁵, Special Areas of Conservation (SACs)⁶, RAMSAR sites⁷, Sites of Special Scientific Interest (SSSIs)⁸ and Marine Conservation Zones (MCZs, see Box 1). Unlike other types of MPA, the designation and management of MCZs involves taking social and economic factors into account alongside conservation objectives. MCZs are designed to complement and not duplicate other types of designation and they are an essential component of the UK’s MPA network. In the absence of MCZs, the full range of features present in the UK marine area would not be afforded protection.

Box 1: MCZs, conservation objectives and management measures

MCZs are a type of Marine Protected Area (MPA) and are created under the Marine and Coastal Access Act (MCAA) 2009⁹ in England and Wales. They protect areas that are nationally representative and important to conserving diversity and nationally rare or threatened habitats or species. The features listed for designation are habitats, species or geological features. Their designation will ensure that the range of marine biodiversity in the UK’s seas is conserved, and that the condition of features is improved if they are currently in an unfavourable state and thus require additional management measures. Examples of features are intertidal mixed sediments (habitat), native oyster (species) and North Sea Glacial Tunnel Valleys (geological feature). Unlike for other types of MPA, for MCZs, social


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

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


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

⁸ Designated under the Wildlife and Countryside Act 1981 (as amended).

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

1.4. The Department for Environment, Food and Rural Affairs (Defra) is responsible for the designation of MCZs in waters where the Secretary of State is the “appropriate authority”. These are English inshore waters (up to 12 nautical miles from the coastline) and offshore waters adjacent to England and Northern Ireland (12 to 200 nautical miles or to the agreed administrative boundary with neighbouring countries). The Devolved Administrations are responsible for designating MCZs within their own waters and these are not examined here.

1.5. In 2009 Defra invited the Statutory Nature Conservation Bodies (SNCBs), composed of the Joint Nature Conservation Committee (JNCC) and Natural England, to recommend potential MCZs with stakeholder support to the government. The SNCBs set up a project to give sea-users and stakeholder interest groups the opportunity to make recommendations through the establishment of four Regional MCZ Projects. The SNCBs provided the Regional MCZ Projects with guidance on the criteria for selecting a network of MCZs in their regions (Ecological Network Guidance based on the OSPAR network design principles) and provided project delivery guidance setting out the process that should be followed to select site locations and to complete accompanying Impact Assessments (IA) for groups of sites.

1.6. In September 2011, recommendations for 127 MCZs were submitted to government. Whilst recognising that the recommendations had come from a stakeholder-led process, concerns were raised about the quality of the evidence base supporting the recommendations. As a result of these concerns, in November 2011 a written ministerial statement announced that MCZs would be designated in tranches, with the best-evidenced sites designated first. A revised timetable for designation and additional funding to support further evidence gathering were also announced.

1.7. Following evaluation of the recommendations and IAs from the Regional MCZ Projects, formal advice from the SNCBs, and advice from an independent Science Advisory Panel, 31 recommended sites were considered suitable for designation in the 1st tranche and were consulted on publicly in 2012.

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


After consideration of the responses and evidence received during the public consultation, 27 MCZs were designated in November 2013 as the 1st tranche. These sites covered an area of around 3,745 mi² and protected 162 features. The final supporting IA received a green opinion from the Regulatory Policy Committee (RPC).

At this time Defra also announced future plans for MCZs, which included a 2nd tranche in 2015 and a 3rd later tranche to complete the English component of the UK’s network contribution. The 2nd tranche of MCZs was consulted on publicly in 2015, and a further 23 MCZs were designated in January 2016. The second tranche of sites covered an area of around 4,175 mi² and protected 234 features. Again, the supporting IA received a green opinion from the RPC.

Collectively, the 1st and 2nd tranches provide protection to an area of over 7,700 mi² within 50 sites and protect a total of 597 features.

Once an MCZ is designated, the regulators, including the Marine Management Organisation (MMO) and the Inshore Fisheries Conservation Authorities (IFCAs), are empowered to introduce appropriate management measures in MCZs to ensure their protection. This may include voluntary arrangements, codes of practice, extra license conditions or the introduction of byelaws. Any byelaw would be accompanied by an IA and would be subject to public consultation.

This IA considers the costs and benefits of designating the 3rd tranche of MCZs. All direct costs and benefits presented in this IA have been calculated in line with the HMT Green Book. Due to limited evidence behind environmental and economic benefits, it was not possible to select sites purely on a cost-benefit basis. Instead a balance between protecting key ecological features and minimising costs to sea-users has been adopted. Nonetheless, this choice is underpinned by scientifically robust evidence and focuses on prioritising designation where the risk of feature loss/damage is higher, as well as sites where the feature's uniqueness should be preserved. Hence, the methodology applied to this and previous tranches takes a hybrid approach with the objective of combining the best available option from a scientific perspective with the least associated cost. As a sense-check, the literature on economic benefits has been assessed to give a broad picture of the magnitude of benefits and indicative qualitative estimates to ensure that proposed approaches are proportionate (see Table 5).

2. Problem under consideration

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

2.2. To inform the selection of site options for the 3rd tranche, Defra asked JNCC to carry out an assessment of the progress made towards completing an ecologically coherent network in Secretary of State waters. This provided us with an analysis of the remaining gaps in the network that needed to be filled through the 3rd tranche.

2.3. JNCC’s report\textsuperscript{17} recommended that, in addition to considering Regional MCZ Project sites and protecting additional features in existing MCZs, to fill the remaining gaps in the network it would be necessary to identify a small number of new site options.

2.4. New site options were developed by JNCC and Natural England to address the remaining ecological gaps in the network while minimising any socioeconomic impacts on sea-users. The approach taken to identify potential new site options is set out in a published report\textsuperscript{18}. Twelve candidate sites were identified and these were discussed with stakeholders during the pre-consultation engagement period (see Section 7.2).

2.5. Suitable site options for the 3rd tranche were therefore selected from two sources:

- **Sites recommended by the Regional MCZ Projects in 2011 but not designated or removed from consideration in the 1st and 2nd tranches:** Due to the length of time since the original recommendations, JNCC and Natural England provided updated scientific advice on these sites, incorporating data from surveys conducted in the intervening period. Additionally, socioeconomic information was updated using the best available data sources and evidence gathered during pre-consultation discussions with stakeholders.

- **New site options developed by JNCC and Natural England in 2016:** JNCC and Natural England provided scientific advice on the ecological importance and conservation objectives for these sites. Socioeconomic information was collected to understand the likely impact of designation and stakeholders were consulted to provide views and evidence.

2.6. Regardless of their origin, the process for considering sites for the 3rd tranche followed similar principles to the 1st and 2nd tranches. Each of the candidate sites was considered in terms of its potential contribution towards completing an ecologically coherent network and the associated social and economic costs and benefits of designation.

2.7. In addition to identifying suitable new sites, consideration was also given to filling gaps in the network by designating additional features within existing 1st and 2nd tranche MCZs, where this was the least-cost option for filling those gaps. These are features that were not supported by sufficient scientific evidence during previous tranches, but for which subsequent survey data has become available and supports designation. Consideration was given to any additional socioeconomic impacts that designating new features within an existing site might have.

\textsuperscript{17} JNCC 2016. Assessing progress towards an ecologically coherent MPA network in Secretary of State Waters in 2016: Results: http://jncc.defra.gov.uk/pdf/JNCC_NetworkProgressInSoSWaters2016_Results_Final.pdf

2.8. During 2016 and early 2017, Defra, JNCC and Natural England undertook a programme of pre-consultation engagement with local, national and, where appropriate, international stakeholders to better understand the potential socioeconomic impacts of the sites being considered for the 3rd tranche. This was an opportunity to obtain views, further evidence and to identify compromise solutions where appropriate (e.g. boundary changes). Further information is provided in Section 7.2.

2.9. In addition to considering sites and features to contribute to an ecologically coherent network, Defra also considered the case for MCZs to protect highly mobile species such as dolphins, birds, fish, sharks and rays. Many highly mobile species are already protected under existing legislation and it is recognised that due to their mobile nature, spatial protection measures are often not the most effective means of conserving these species. However some highly mobile species have been protected in existing MCZs, and other types of MPAs, where specific locations are critical for their lifecycle (e.g. spawning or nursery grounds), and so are suitable for area-based protection measures, such as MCZs. In 2016, in response to requests from NGOs, they were invited to propose sites where there was clear evidence that an MCZ would provide effective protection for a highly mobile species. JNCC and Natural England developed principles for identifying the suitability of MCZ protection for a highly mobile species and provided guidance to assist those proposing suitable sites19.

2.10. Twenty-one proposals were received, covering seabirds, fish species and white-beaked dolphin. The scientific case and socioeconomic costs of each proposal was assessed and five proposals were considered suitable to take forward to public consultation.

2.11. Following consideration of the remaining Regional MCZ Project sites, the new site options and the proposals for highly mobile species, Defra identified a total of 41 sites that were suitable to take forward to public consultation. Thirty were Regional MCZ Project recommendations (from the original 127 sites recommended), nine were new site options and two sites were for protecting highly mobile species.

2.12. Defra also identified 29 additional features in 12 existing 1st and 2nd tranche sites that were suitable for inclusion in the consultation alongside the proposed 3rd tranche sites.

2.13. The formal public consultation on the 3rd tranche of MCZs was published on June 8th 2018 to test support for the proposed sites, to gather additional information and to test the cost estimates and methodologies presented in the consultation IA. Details of the consultation and the decisions taken following analysis of consultation responses are summarised in Section 3 below.

3. Summary of formal public consultation and outcomes

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

3.2. The 3rd tranche consultation IA (Impact Assessment Defra/MAR/008) received a green-rated opinion from the RPC and was published on the main consultation website. This IA included the preferred policy option (Option 1) of designating the 3rd tranche of 41 new MCZs alongside adding some additional features to 12 sites designated in the 1st and 2nd tranches. This allowed consultees to compare this option against the government’s baseline of not designating further MCZs.

3.3. The consultation was used to test support for designating the proposed sites, to gather additional information and to test the cost estimates and methodologies presented in the consultation IA. Over 48,500 consultation responses were received, with the majority of respondents expressing support for designating MCZs. A full government response to the consultation, outlining the evidence received and explaining the decisions taken on each site will be published at designation.

3.4. All consultation responses were considered in full. Responses that included information relevant to the ecology of the sites (e.g. evidence relating to the presence, extent or condition of features to be protected or to activities taking place in the vicinity of the proposed MCZs) were also shared with Natural England and JNCC. All new and verifiable information directly relevant to the MCZs under consultation was fed into the SNCB’s post-consultation scientific advice reports. Alongside this information, Natural England and JNCC obtained additional information, such as updated survey data, through more general evidence updates to ensure that their final post-consultation ecological advice was complete and comprehensive.

3.5. Responses that included information relevant to determining the socioeconomic impact of designating sites (e.g. relating to the costings or methodologies presented in the consultation IA or providing evidence of activities taking place in the vicinity of the proposed MCZs) were shared with Defra economists. All information was considered in full and new and verifiable evidence was fed into the calculation of post-consultation socioeconomic costings. All updated costings have been incorporated into this IA and Section 7 describes in greater detail where cost estimates have changed following consultation responses.

3.6. Following consideration of the consultation responses received, the updated scientific advice provided by the SNCBs and the updated socioeconomic costings, Defra have concluded that all 41 new sites and the additional features to be added to existing sites (as set out in the tranche 3 consultation) are suitable for designation. Minor changes have been made to the following sites:

- **Studland Bay MCZ** – Natural England’s post-consultation advice for this site was that the evidence for the presence and extent of one of the features consulted on, subtidal coarse sediment, was no longer sufficient to support designation. On this basis, the site will be designated for all other features consulted on, but not for subtidal coarse sediment.

- **Bembridge MCZ** – In response to concerns raised about future navigational dredging within the small Bembridge harbour section of the site, the boundary for this MCZ has been adjusted to remove the harbour area. This change will not have an impact on achieving the ecological targets for the network.

3.7. The SNCB’s updated scientific advice also advised changes to the GMA for six features within five sites. The specific situation for each of these features was considered in full to understand whether there were likely to be any differences in management implications.

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21 This document will be published at: https://www.gov.uk/government/publications?departments%5B%5D=department-for-environment-food-rural-affairs&publication_filter_option=consultations  
22 These documents will be published at designation and can be accessed via links provided in the government response document.
and associated site costings. This assessment identified that no changes to management implications or costings were anticipated as a result of these GMA changes.

3.8. Of the 41 new MCZs to be designated in 2019 (preferred Option 1), 39 are in English waters and two are within Northern Irish offshore waters\textsuperscript{23}. The total area covered by the new sites is 7278 mi\textsuperscript{2}: approximately 2,138 mi\textsuperscript{2} in the inshore area and 5139 mi\textsuperscript{2} in the offshore area. Following designation, around 40% of English inshore and offshore waters will be protected, and the total for the UK as a whole will be almost 25%.

3.9. The names and locations of the 41 sites are shown below in Chart 1. Further details of these new sites are provided in Annex G and details of existing MCZ sites where additional features will be designated are provided in Annex F.

\textsuperscript{23} All are in waters where the Secretary of State is the 'appropriate authority'.
4. Rationale for government intervention

4.1. A biologically diverse marine environment is of high value to society through the services that it provides and as a basis for human health and livelihoods (OSPAR 2010). Fish and shellfish landings and marine aquaculture have a clear market value, but the marine environment also provides non-traded services including carbon sequestration, natural hazard protection, recreation, research and education. Aside from its economic value to society, the natural environment also has intrinsic or ‘non-use’ value. Work by the National Ecosystem Assessment Follow-On project and more recent literature (see Annex B) supports this and in particular highlights the significant importance of ecosystem services, including less tangible cultural benefits, derived from a good quality marine environment.

4.2. Human activities are having a detrimental effect on the extent and condition of many diverse marine habitats and their ecosystems. OSPAR’s 2010 Quality Status Report noted that a reduction in the decline in biodiversity is still a long way off, and that combined pressures from human activities are not fully understood and need to be carefully managed to avoid undesirable impacts. Although OSPAR’s 2017 Intermediate Assessment identified some positive indications of change, such as reduced contaminant pollution and signs of recovery of fish communities in some areas, significant areas of concern remain. The most threatened marine and coastal habitats in the UK, as identified in the UK Biodiversity Action Plan (JNCC 2010) are continuing to decline, and maintaining or increasing the extent and condition of priority habitats is more difficult in coastal and marine areas than in the terrestrial environment. It is important that appropriate measures are introduced in order to protect our marine ecosystems before it is too late. The most recent comprehensive assessment of the UK marine environment (UKMMAS 2010) showed that there are still key externalities to the marine environment to be addressed both in the short and long term.

4.3. There is a need for government intervention to address market failures associated with public goods and negative externalities to protect valuable features of the marine environment. Market failures occur when the market has not and cannot in itself be expected to deliver an efficient outcome (HMT Green Book 2018). In the context of the marine environment these can be described as:

- Public goods – A number of goods and services provided by the marine environment such as climate regulation and biological diversity are ‘public goods’. The defining features of a public good are that no-one can be excluded from benefiting from these services and that consumption of the service does not diminish the service being available to others. These characteristics mean that individuals do not necessarily have an economic incentive to voluntarily contribute effort or money to ensure the continued existence of these goods, they can “free ride”. This can lead to undersupply or, in this case, under-protection and consequent degradation.

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24 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”.


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

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

5. Policy objective and intended effects

5.1. To deliver the vision of ‘clean, healthy, safe, productive, and biologically diverse oceans and seas’, as set out in the 25 Year Environment Plan and the UK Marine Policy Statement, the government has committed to contributing to an ecologically coherent UK network of well-managed MPAs. However, neither English waters nor UK waters are a single ecological entity within a biogeographic context. Our aim therefore is for the UK MPAs to contribute to an ecologically coherent network on a biogeographic basis and as a UK contribution to the wider OSPAR network. A coherent network will provide more benefits than an individual area would on its own, and will protect multiple habitats and species.

5.2. MCZs are an essential component of the MPA network and government has a legal duty to designate MCZs under the MCAA 2009 in order to contribute to the network. The sites and features to be designated in the 3rd tranche are needed to meet this legal obligation. The designation of MCZs will help to ensure that the conservation of habitats and species is given increased priority in the regulation and management of human activities, enabling features to be protected and conservation objectives achieved.

5.3. Following the designation of 50 MCZs in two previous tranches, the current policy objective is to designate a 3rd tranche of MCZs to complete a ‘Blue Belt’ of protected sites in the waters that the Secretary of State is responsible for.

5.4. Unlike for other types of MPA, the MCAA 2009 allows for the consideration of socioeconomic impacts when designating MCZs. The sites selected for the 3rd tranche are those that best meet the remaining ecological gaps in the MPA network whilst minimising any negative socioeconomic impacts on sea-users. This approach follows the same rationale used for the 1st and 2nd tranches.
6. Descriptions of options considered

Overview of Baseline Option

6.1. The baseline (Option 0) or the ‘do nothing option’ encompasses all current protection and legislation. This includes protection for features already recognised within European Union (EU) or national lists\(^{30}\), and the existing network of MPAs, including the 50 MCZs designated in the 1st and 2nd tranches.

6.2. This is not a viable policy option because Section 123 of the MCAA places a legal obligation on government to contribute to a network of MPAs to protect nationally important habitats, species and geological features. The 50 sites designated within the 1st and 2nd tranches would not meet this obligation. An ecologically coherent network of MPAs is also required to fulfil existing international obligations, such as meeting our OSPAR commitments. Ministers have committed to designating MCZ sites in tranches and not proceeding with the 3rd tranche of MCZs would leave the network incomplete.

6.3. The ‘do nothing option’ provides the baseline against which the costs and benefits of the 3rd tranche of MCZs are calculated (in line with IA guidance and the HMT Green Book 2018). As with previous tranches, this baseline is assumed to be static rather than dynamic and assumes that in the absence of MCZ designation, features will remain in their current condition. It therefore does not take into consideration future pressures taking place in the marine environment and the assumption is that these pressures will be addressed as part of the licensing and wider regulations in place. The approach of assuming a static baseline is not ideal but it would not be possible to calculate costs in line with a deteriorating baseline due to the high level of uncertainty around when, and to what extent, deterioration would occur. Table 1 describes costs to private industry and public bodies that are already accounted for as part of the baseline scenario.

6.4. When possible, assumptions on future activities from different sectors (for example, licence applications for renewable energy developments) were included on a sector-by-sector basis and validated with industry and government bodies as appropriate.

Overview of the preferred Option 1

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

6.6. Option 1 involves designating 41 MCZs in 2019, alongside designating some additional features within 12 existing sites. These sites and features were identified to fill the

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\(^{30}\) Features may be subject to one or more of the following national and multi-lateral agreements: (1) OSPAR List of Threatened and/or Declining Species - features that are considered to be under threat or in decline, and may be rare or particularly sensitive; (2) UK BAP Priority Habitats and Species - features of international importance, at high risk or in rapid decline, as well as habitats that are important for key species (UK BAP priority habitats and species are now referred to as Habitats or Species of Principle Importance under the UK Post-2010 Biodiversity Framework); and (3) Wildlife and Countryside Act, Schedule 5 - species likely to become extinct from the UK unless conservation measures are taken, and species subject to an international obligation for protection.
remaining ecological gaps in the MPA network whilst minimising the impacts on sea users. This option balances the ecological benefits of designation with the socioeconomic implications to deliver a proportionate and cost-effective contribution to the MPA network.

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

7. Costs under the baseline and preferred option

Costs under the baseline scenario

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

- Costs of marine licence applications – applicants for marine developments and some activities have to carry out an assessment of the environmental impact that they would impose on already designated features, or to comply with existing related legislation. Costs of Environmental Impact Assessments (EIAs) vary depending on project size; a study of 18 EU examples found EIA costs range from 0.01% to 2.56% of the total development cost with the average being 0.5%.

- Mitigation actions – where a particular development or activity is identified to have an adverse impact on existing protected features, the respective individuals or licensed operators may have to take actions to mitigate these impacts (e.g. amending location, adding cushioning for cables, micro-siting around features, etc.).

- Costs to fisheries – commercial fisheries may incur costs in the baseline due to existing closed areas, quota and effort and/or gear restrictions.

- Public sector costs – the costs covered by public expenditure including the monitoring of vessels, catches and species stocks, the management of existing licence applications and protected areas, and national defence.

- Some costs are fixed as they occur because of the existence of an MCZ network, rather than due to any particular tranche. Consequently these costs are not dependent on additional sites being designated and were fully represented in previous tranches of MCZs.

31 Note that, consistent with Impact Assessment guidance, we assume that these previous policies have been effectively implemented.
32 Costs in excess of 1% of capital costs were the exception, and occurred in relation to particularly controversial projects in sensitive environments, or where good EIA practice had not been followed. See: http://ec.europa.eu/environment/eia/eia-studies-and-reports/eia-costs-benefit-en.htm
Table 1: Summary of baseline costs to private industry and public bodies (all acronyms are explained on page 4)

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<tr>
<th>Impacted Private Sector</th>
<th>Description of baseline costs – no figures included because it is not proportionate or useful to decision making to monetise baseline costs and benefits</th>
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| Aggregate extraction    | - Existing costs of obtaining a licence for aggregate extraction.  
                          - Mitigation costs may be incurred to avoid damage to features protected under existing legislation and/or designations (conditions restricting where and how operation is carried out).  
                          - Costs incurred by the BMAPA to produce biodiversity action plans. This cost is due to the existence an MCZ network, rather than any tranche in particular. This cost is fully represented in the 1st tranche IA. |
| Cables                  | - Licence application costs for activity within 12nm of the shoreline, including assessment of environmental impact on existing features. Industry undertakes this voluntarily in areas outside of 12nm as there is no legal requirement to do so, except in cases where cable protection is required where burial has not been possible. 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 existing features.  
                          - Mitigation may be required (such as moving planned location, using different materials) to avoid damage to existing protected features. |
| Commercial Fisheries    | - Existing fisheries regulations (i.e. the Common Fisheries Policy (CFP) within the EU or the national equivalent) e.g. limits on commercial fishing of quota stocks, discard bans and effort & gear restrictions.  
                          - Existing UK fisheries management measures, e.g. IFCA byelaws, voluntary codes of conduct. |
| Flood and Coastal Erosion Risk Management | - Licence application costs, including costs of assessment of environmental impact to consider impact on previously designated features.  
                          - Mitigation may be required (such as moving planned location or restrictions on construction activities) to avoid damage to existing protected features. |
| Heritage Assets\(^{34}\) | - Current costs for licence applications, including licence applications for archaeological activities on Historic Protected Wrecks.  
                          - Depending on the scale and type of activity, the MMO or Natural England may advise that an assessment of environmental impact is undertaken.  
                          - Historic England requires that records of all sites of historic or archaeological interest are considered in any licence application.  
                          - In some areas, vessel anchoring is considered in the baseline through restrictions or codes of conduct in place to protect any sensitive features including archaeological sites. |
| Oil & Gas               | - Licence application costs, including costs of assessment of |
environmental impact to consider impact on previously designated features.
- Mitigation activities may be required (such as pipeline routes, chemical release) to avoid damage to existing protected features.

| Ports, Harbours, Commercial Shipping and Disposal Sites | - Licence application costs, including costs of EIA to consider impact on previously designated features.  
- Mitigation may be required (such as moving planned location, using different materials, seasonal restrictions) to avoid damage to existing protected features, in relation to activities such as dredging, disposal, laying and maintenance of moorings and development/expansion. |
|---|---|
| Recreation | - Cost incurred from management and best practice advice in relation to potentially damaging activities such as anchoring and wildlife watching.  
- Specific management of activities in MPAs. |
| Renewable Energy | - Licence application costs, including costs of EIA to consider impact on features.  
- Mitigation may be required (such as adjusting planned cable routes, using different turbine foundations, seasonal restrictions on activity), to avoid damage to existing protected features. |

<table>
<thead>
<tr>
<th>Impacted Public Sector</th>
<th>Description of baseline costs</th>
</tr>
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| National Defence | - Costs of adjusting electronic tools and charts.  
- Annual costs of maintaining tools and charts to include existing MPA sites in the absence of MCZs.  
- Additional planning considerations for existing protected sites. |
| Marine Management | - Costs to the MMO and IFCAs to monitor existing protected features and sites, enforce national fisheries regulations (i.e. the CFP within the EU or the national equivalent) and the administration of the marine licensing process. |
| Ecological Surveys and Monitoring | - SAC and SSSI monitoring;  
- Biodiversity monitoring by Natural England and JNCC to meet existing legal requirements and for 1st and 2nd tranche sites. |

**Stakeholder engagement process**

7.2. Box 2 below provides information on how stakeholder engagement has informed the development of potential management scenarios and the consequent calculation of industry costs for the 3rd tranche of MCZs. In 2011 the Regional MCZ Projects collected information from stakeholders about the level and type of human activity in each MCZ (or group of sites). This informed the identification of potential management scenarios and possible and preferred management measures.

7.3. For the purpose of the 3rd tranche, during 2016 and 2017, Defra, Natural England and JNCC carried out pre-consultation stakeholder engagement to seek stakeholder views and to gather any relevant information held on the Regional MCZ Project candidate sites and the new site options being considered. Potential sites were discussed with stakeholders at a number of local and national events and meetings. In November 2016, JNCC held a two-day workshop to discuss the tranche 3 offshore sites and new site options. Several alternative proposals were made by stakeholders during this event and these were investigated in full and taken forward where appropriate. The workshop was followed up by a webinar in February 2017 to present and allow for comment on the final
offshore new site options that had been developed. Again this provided an opportunity for stakeholders to provide information and register any concerns. Reports were written up and published from both the workshop and webinar to capture stakeholder views. The information collated in previous tranches as well as during the pre-consultation engagement exercise enabled Defra to verify whether the sites proposed were the most viable ones.

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

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

1) The management scenarios used in the analysis for the IA were identified using information about the sensitivity of species and habitats recommended for protection in each MCZ as well as information about the level and type of human activities in each site collected from stakeholders.

2) The management scenarios were also informed by advice provided by Natural England and JNCC on the mitigation that is likely to be needed. This advice does not pre-judge the advice that Natural England and JNCC will provide (as Statutory Nature Conservation Body advisers) for specific licence applications or for any future site-specific licensing decision.

3) Specialists in Natural England and JNCC provided site-specific advice on the mitigation that is likely to be needed for proposed plans and projects that are not yet consented and could impact on MCZ features. Natural England and JNCC engaged with stakeholders for specific sites to try to alleviate any concerns and to be informed of any local specific issues.

4) Defra economists collaboratively developed potential management scenarios that reflected the mitigation that was likely to be needed, based on the information provided in (1) (2) and (3) above. Activities, and where possible management scenarios, were updated as part of the pre-consultation engagement process. Additional information submitted by stakeholders during the formal consultation period has also been considered by appropriate experts in Defra, Natural England, JNCC, the MMO and Cefas.

5) To ensure that the management scenarios do not underestimate the costs of mitigation that would be required, a sensitivity analysis is carried out for all sectors which includes high cost management scenarios where appropriate. Pre-consultation with industry and stakeholder engagement has informed this analysis and new information submitted during the formal consultation has been considered in order to reduce uncertainties.

6) For all management scenarios, unit costs are used and the assumptions are appropriately informed by advice from SNCBs and regulators. The best estimate scenario for sectors was informed by an assessment of whether the low or high cost scenarios were the more likely. The IA analyses include cost estimates by government departments, Natural England, JNCC, stakeholder representatives and internal experts in environmental economics.

7) The cost estimates and methodologies were tested during consultation and

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35 JNCC’s reports are available at: http://jncc.defra.gov.uk/page-7325
Costs of the preferred option (option 1)

7.5. The preferred option to designate 41 MCZs can be considered in the context of correcting market failures in the marine environment, as discussed in Section 4.3. In particular, management measures adopted to conserve features will help address the problem of environmental damage not being taken into account by users, individuals and businesses alike. The options selection process in identifying optimal size and type of sites began in 2011 - as part of the Regional MCZ Project - which led to a preferred option to designate 127 sites in three different tranches. Since that time, further steps have been taken to refine site selection, for example, the consideration of remaining gaps in the network and the development of new site options (see Section 2).

7.6. In line with HMT Green Book guidance, only additional costs and benefits related to designation of features in the 3rd tranche MCZs are included. Consequently this option only represents the costs resulting from the additional designation and the benefits flowing from the additional protection.

7.7. Features not included in the designation process of the 3rd tranche of MCZs, which are located inside the MCZ boundary and already benefit from protection, are considered part of the baseline as discussed above. Hence the costs and benefits relating to the protection of features under current legislation are not included.

7.8. As with the 1st and 2nd tranches, impacts are assessed over a 20-year period. The costs and benefits of designation are long term in nature, hence a 20-year appraisal was considered appropriate. Annex D provides a breakdown of the costs each year and it shows that the majority repeat annually or periodically beyond 10 years; meaning a shorter appraisal period would omit several significant industry impacts (e.g. the 15 year licence renewal assumption for aggregates). Furthermore, the Regional MCZ Projects, which informed the 1st and 2nd tranche impact assessments and engaged with stakeholders, used a 20-year appraisal period; therefore using the same timeframe will ensure consistency with the work previously delivered.

7.9. Studies used to inform benefits in this IA (e.g. RPA 2013 & Kenter et al. 2013) also assessed over a 20-year period or longer. Due to the nature of ecosystem service processes and functions, many significant benefits from designation (e.g. improvement in the condition of a feature if currently unfavourable) will not be realised until beyond 10 years, particularly within the marine environment. Therefore, a shorter time period would not capture the full extent of recreational benefits to tourists, anglers & divers and non-use values to the wider public as many features would still be recovering or may not have improved at all due to time lags. Monetised benefits, despite large uncertainties, are better represented over a 20-year appraisal period and especially when compared to costs for the reasons described in Section 7.8.

7.10. While the MCZ designations can reasonably be expected to generate costs and substantial benefits beyond 20 years, uncertainty beyond this point makes further analysis challenging. All costs have been subject to sensitivity analysis, calculated on a sector-specific basis using the best available evidence, in order to account for these uncertainties. All values are presented as 2016 prices (present value base year 2019).
and projected values are given in constant prices. The present value of the costs and benefits has been calculated using a discount rate of 3.5% as per the HMT Green Book guidance.

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

- **Private sector costs relating to activities where limited or no additional mitigation is required.** This situation occurs when a maintain GMA is in place but there are additional costs to obtain a licence due to the need to assess the environmental impact of an activity on a protected feature. This includes activities for which an operator has to apply for a licence (to the MMO, BEIS, etc.) such as aggregate extraction, navigational dredging and disposal, oil and gas-related activities, port and harbour developments and renewable energy developments. For certain activities, these additional costs also include familiarisation costs. This is because a business applying for a licensable activity would have to become familiar with new protected areas in proximity to the proposal. A business would only need to become familiar with a designation if it wishes to apply for a licence which requires an appropriate assessment. Existing baseline licensable activity already has consent conditions attached to it which would continue even without designation in place. Familiarisation costs have not been monetised here. In the case of management of commercial fishing activity, management of a particular site is decided by regulators and where a new byelaw is introduced there will be an accompanying impact assessment, including stakeholder engagement, to inform vessel operators of any new restrictions. Not all fishermen would need to become familiar with management measures for all MCZs so any familiarisation costs would be accounted for within local IAs. The same assumptions applied for both the 1st and 2nd tranches and they were widely accepted. More detailed information about how these extra costs were derived and associated assumptions are found in Annex D.

- **Private sector costs relating to activities where management/mitigation is required.** This situation occurs when there is a recover GMA in place and specific changes need to be made to protect the designated feature(s) within the MCZ. This primarily affects the fishing and recreational sectors, since most other sectors are already required to mitigate impacts on MCZ habitats and species that are recognised within EU or national lists (see Section 6.1). Management of activities for fisheries and recreation will be put in place by regulators once sites are formally designated. Management requirements will be determined on a site-by-site basis to meet the site’s conservation objectives (based on advice from the SNCBs) whilst minimising the impact on sea users. For example, a particular type of fishing gear might be known to damage a feature and would therefore be managed over the specific area of the feature in order to allow the feature to recover to a favourable condition. This IA therefore assesses costs based on the most likely management scenarios, informed by advice from Natural England, JNCC and relevant stakeholders. More specific local management measures requiring interventions such as byelaws will be subject to separate IAs. The extra costs associated with site designation will account for uncertainty and a best estimate is provided. Site-specific management scenarios for commercial fisheries and recreation are presented in Annex A and an overview of sector costs and assumptions is provided in Annex D.
For all sectors where additional mitigation is required, this has been assessed on a case-by-case basis. In situations where MCZ designation results in mitigation costs that are prohibitively expensive, and where other conditions are met, the MCAA (2009) Public Benefit Test will apply. This means that the MMO will determine whether the benefit to the public of proceeding with the proposed development clearly outweighs the risk of damage to the environment that will be created by proceeding with it. If the benefit to society outweighs the ecological cost, it is unlikely that the activity will be restricted. Such conflicts are not expected to arise as a result of the designation of this 3rd tranche of sites because sites were not taken forward where this was likely to be an issue.

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

### Summary of Sector Cost Methodologies

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

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

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36 See s.126(7)(b) and (c) of the MCAA (2009) and the MMO’s assessment process for MCZ licence applications: [https://www.gov.uk/guidance/marine-licensing-impact-assessments](https://www.gov.uk/guidance/marine-licensing-impact-assessments)  
37 If so, the applicant must satisfy the MMO that they will undertake or make arrangements for the undertaking of measures of equivalent environmental benefit to the damage which the act will or is likely to have in or on the MCZ. To weigh up societal and ecological costs, the MMO will use information supplied by the applicant with the licence application, advice from the SNCBs, other government departments, Local Authorities, Local Enterprise Partnership, the Marine and Coastguard Agency and others where appropriate.  
38 Estimated costs from management and ecological surveys have been subject to confirmation from relevant bodies. JNCC/NE/MMO pers. comm. 2019.
• Resulting changes to cost estimates following consultation are discussed both below and in Annex D.
• Note that the pre-consultation figure has been uprated to 2016 prices and therefore differs from the pre-consultation IA.

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

7.13. Firms engaging in aggregate extraction are subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. It is assumed that the impact of aggregate extraction on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO.

7.14. Two scenarios were developed for the IA: a low cost scenario (also used as best estimate) and a high cost scenario\(^ {39}\). The assumptions for each scenario are summarised below.

7.15. The low cost scenario considers licence applications in areas which have already been granted approval for development, known as existing production and option licence areas. There is an additional one-off cost to operators for future licence/licence renewal applications in existing production licence areas within 0.6 miles (1 km) of an MCZ. This is based on the need to assess the impacts on features protected by an MCZ. The high cost scenario considers one-off additional impact assessment costs for all future licence applications only in strategic Resource Areas which have yet to be granted approval for development and are identified as overlapping or being ‘in close proximity’ to an MCZ. More information on how the costs were ascertained is provided in Annex D.

7.16. During consultation, no new issues were raised concerning the estimation of costs to the aggregates sector. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed, bar uprating to the relevant base year.

Aquaculture – No extra costs quantified

7.17. Where relevant, management scenarios have been identified for MCZs based on assumptions about the management of aquaculture that may be required in order to achieve the conservation objectives of features protected. When possible, these scenarios have been used for the purposes of the IA, in order to estimate the potential magnitude of the effects on the sector of designating MCZs\(^ {40}\).

7.18. Of the sites in the 3rd tranche only one, the Dart Estuary, was identified as likely to require management of aquaculture activities. The remaining sites do not have aquaculture activity in close proximity or have no expected impact from aquaculture on protected features. For the Dart Estuary, aquaculture management is likely to consist of the monitoring and removal of feral oysters. Costs have not been quantified because it is difficult to specify the extent of additional management at this stage without a baseline assessment, however costs are likely to be low.

7.19. During consultation, no new issues were raised concerning the estimation of costs to aquaculture. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed.


Heritage Assets – No extra costs quantified

7.20. It is assumed that the potential impact of archaeological activities on features protected by MCZs will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO. Based on the advice of Historic England and the MMO, all licence applications to Historic England and the MMO for archaeological activities proposed within MCZs will require additional work to be completed in support of the application in regards to broad scale habitats. This is because impacts on the other habitat and species features are already currently assessed without MCZs, but specific impacts on broad scale habitats are not (JNCC and Natural England 2011a).41

7.21. Due to lack of information about future licence applications (where the assets/activities will be, what they will comprise and when they will take place) or suitable historical data with which to forecast future activities, it has not been possible to quantify the impacts of MCZs on archaeological activities. Costs may arise through the mitigation of impacts of future archaeological activities on MCZ features where required, but these are expected to be small since the impacts will be addressed as part of the licensing system currently in place. Moreover, increased costs may be incurred for future licence applications to undertake activities. However as the footprint of archaeological activity is small compared to the size of broad scale habitats, any additional licence costs are expected to be minimal. It is assumed that any additional costs will be incurred by the licence applicant (mainly archaeological bodies and research institutions such as universities), the licensing bodies (Historic England and MMO) and the SNCBs.

7.22. During consultation, no new issues were raised concerning the estimation of costs to heritage assets. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed.

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

7.23. The cable sector includes the transmission (power) and telecommunications (telecom) cables sector. The sector is subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. It is assumed that the impact of cable laying on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO. There will be an additional cost to an operator to conduct an appropriate EIA of future cable installation on broad scale habitats protected by an MCZ. Additional assessment costs will only be incurred for inshore MCZs (from mean high water out to 12nm) as there is no legal requirement to do an assessment of impacts beyond 12nm other than marine licences for very specific activities, such as rock protection. Due to the rarity under which these circumstances occur in the offshore environment within the vicinity of an MCZ, and the unavailability of robust scientific evidence, it has not been possible to monetise these costs but we expect them to be low. No additional mitigation of impacts on features protected by MCZs have been identified. It is also assumed that additional mitigation of impact will not be required for the repair and replacement of existing and future cables beyond 12nm as the footprint of cables is very small compared to broad scale habitats and there is no legal requirement to mitigate impacts beyond 12nm42.

7.24. The specific locations of all future cable routes are not known. Therefore the estimated cost to the cables sector is not based on specific projects; instead an estimate of the number of potential licence applications over the 20-year IA period was agreed with the UK Cable Protection Committee (UKCPC) during the 1st tranche IA. This estimate was maintained for the 2nd tranche IA as well as for the 3rd tranche IA but uprated to the relevant base year. For the 1st tranche IA, the costs were calculated for all potential MCZs and then scaled down proportionally for the sites proposed for designation under the 1st tranche. The same approach was taken for the IAs for the 2nd and 3rd tranches. Sensitivity analysis is conducted which varies the assumed quantity of applications over the IA period.

7.25. Three consultation respondents highlighted that the exemption to assessments of impacts beyond 12nm does not apply to some activities (e.g. cable protection, unexploded ordnance removal). Due to the rarity under which these circumstances occur within the vicinity of an MCZ, and the unavailability of robust scientific evidence, it has not been possible to monetise these costs but we expect them to be low.

7.26. The same assumptions have been applied as pre-consultation and costs have not changed, bar uprating to the relevant base year.

**Coastal Development – Costs monetised elsewhere**

7.27. Costs associated with some developments are covered under sector-specific costs elsewhere (e.g. ports and harbours and renewables). The coastal development sector primarily covers maritime structures such as slipways, jetties and marinas and also coastal flooding and defence structures such as seawalls and weirs. It is assumed that the impact of coastal development on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO. Impacts of designation on planned but yet to be consented coastal developments could include additional licence application costs, including additional analysis costs within the EIA to consider the impact on MCZ features and mitigation (such as moving planned location, using different materials and the costs of creating compensatory habitats). Costs have not been quantified for this sector, since, after consulting with some of the competent authorities, they were not in the position to anticipate the types and number of licence applications within a proposed MCZ or in close proximity. However these costs are not expected to be significant since the standard planning applications would cover the required regulatory framework.

7.28. During consultation, no new issues were raised concerning the estimation of costs to coastal development. Therefore, the same assumptions have been applied as pre-consultation.

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

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

\(^{43}\) The term ‘gear type’ refers to the type of commercial fishing equipment used. These are grouped into categories: (1) static fishing gear refers to gears such as pots and set nets; and (2) mobile fishing gear refers to gear that is towed through the water such as demersal towed nets.
proportion of fishing in the entire ICES rectangle area\textsuperscript{44}. Revenues for these areas are known as they are derived from an established methodology based on combining landing values and fishing efforts. For under 15 metre vessels, which tend to fish inshore areas, data coverage is poorer. For these vessels, fishing activity level was instead estimated from IFCA and MMO sightings and surveillance data, following the method used to support previous advice on the distribution of inshore fishing activity as documented in the MB0117 report\textsuperscript{45}. Using this data, baseline revenues for each MCZ have been estimated based on a five year average. For vessels over 15 metres, updated landing revenues for the years 2013-2017 have been employed. For vessels under 15 metres, existing (pre-consultation) landing revenues for the years 2010-2014 have been employed as the later data is not available. Landing revenues have then been converted to gross added value figures using Seafish average GVA ratios\textsuperscript{46} for each gear type in each region. Hence the economic impact estimates presented in this IA are not equivalent to lost revenue; but instead represent the lost value that commercial fisheries contribute to society. Taking this approach enables comparison with other sectors.

7.30. Management scenarios for each MCZ have been developed based on the GMA for features to be protected (see Box 1). These outline the potential management needed to recover protected features to a favourable condition. The SNCBs have published a management advice document\textsuperscript{47} that specifies a range of possible management scenarios for each broad gear type (mobile and static) and for each feature\textsuperscript{48}. Management scenarios were refined using stakeholder knowledge and input during the Regional MCZ Projects process, refreshed as necessary based on pre-consultation engagement with stakeholders in 2016 and 2017 and updated SNCB advice on features to be designated, and tested at consultation in June 2018. Consequently the scenarios are used to estimate the potential economic impact of MCZ designation. Full details of the management scenarios used for the purposes of the IA are given in Annex A.

7.31. To represent the uncertainty in the level of management needed, a range of scenarios were developed for each site. Where the likelihood between the lowest and highest cost scenario was not known, the best estimate was taken as halfway between the low and high cost estimate. This is the case for all bottom-abrading mobile gears for sites in the 3\textsuperscript{rd} tranche, which is consistent with the methodology applied to previous tranches. Where the high cost scenario was considered unlikely (based on SNCB advice and consultation with stakeholders) the best estimate was 25\% of the range between the low and high cost scenarios. This is the case for all static gears (pots and traps, nets, hooks and lines). Site specific management assumptions are given in Annex A and sector assumptions and calculations are given in Annex D.

7.32. As there is likely to be displacement of fishing activity to areas outside of the proposed MCZs, rather than a complete loss of activity, a displacement assumption of 75\% has been applied (25\% of GVA assumed lost) to the best cost management scenario and no displacement assumed (100\% of GVA assumed lost) for the high cost management scenario. The 75\% assumption is based on an analysis carried out by Cefas prior to designating the 1st tranche of MCZs on the extent of overlap between fishing activity and the original Regional MCZ Project recommended sites\textsuperscript{49}. This found that the Regional

\textsuperscript{44} ICES use statistical rectangle areas for the gridding of data to make simplified analysis and visualisation of fishing effort, landings and revenues.
\textsuperscript{45} Defra-funded research project to understand inshore fishing activities: http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=1&ProjectID=18126
\textsuperscript{46} https://www.seafish.org/article/fleet. Gross value added is the value generated by any unit engaged in the production of goods and services.
\textsuperscript{47} http://www.naturalengland.org.uk/Images/MCZ-fish-impacts_tcm6-26384.pdf
\textsuperscript{49} Defra-funded research project: http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18799
Projects recommended MCZs impinged on less than 8.5% of the fishing areas used by any UK or non-UK >15m fleet. For just UK towed gears, the corresponding value was always less than 4%. For the inshore area (predominantly <15m boats) the Regional Projects recommended MCZs impinged on between <1% and 29% of the fished areas in each Regional Project area (considering trawls and dredges). This shows that the 75% displacement assumption is a conservative approach likely to underestimate the amount of displacement in most cases (as the overlap with core fishing grounds in usually significantly less than 25%). There was one substantive challenge to this assumption in tranche 3 consultation responses, but our assessment is that the issue raised did not justify an alternative approach that would be more reliable (see Section 7.38).

7.33. The displacement assumptions for both the best and high cost management scenarios are based on a prudent and cautious approach and validated during the 1st and 2nd tranches of MCZs. Whilst a small number of respondents to the tranche 3 consultation questioned these assumptions, no alternative verifiable method has been proposed, therefore the original assumptions apply.

7.34. As discussed in Section 7.11, familiarisation costs to fishers have not been calculated as the mandatory additional management measures for a specific site are decided and implemented if needed by regulators (MMO and IFCAs) following designation. Regulators would produce IAs with any byelaws to take account of the impacts of any closures or restrictions and to inform stakeholders.

7.35. One consultation respondent highlighted the availability of new VMS data for the period 2013-2017. This updated data has been used to replace data for >15m vessels in our analysis. For <15m vessels, iVMS data were only available for the period 2015-2017. To ensure a five-year average and thus continuity in our method, IFCA sightings data for the period 2010-2014 has been retained for vessels <15m. More recent IFCA sightings data was not available.

7.36. As a result of using more recent landing revenues for vessels over 15m (explained above), the best estimate annual costs for some sites changed from pre-consultation figures. These changes were verified with Cefas and are primarily due to fluctuations in the type of fishing gear used, target species, species value and the use of specific fishing areas. The main changes to sites are summarised below:

- **Cape Bank MCZ:** increase in best estimate annual cost from £670 pre-consultation to £4,446 post-consultation.
- **Holderness Offshore MCZ:** increase in best estimate annual cost from £5,759 pre-consultation to £11,675 post-consultation.
- **South Rigg MCZ:** decrease in best estimate annual cost from £20,079 pre-consultation to £6,241 post-consultation.
- **West of Copeland MCZ:** decrease in best estimate annual cost from £2,383 pre-consultation to £155 post-consultation.
- **West of Wight Barfleur MCZ:** decrease in best estimate annual cost from £2,658 pre-consultation to £37 post-consultation.

7.37. A small number of respondents highlighted the need to consider impacts to fleets fishing outside of MCZs that are affected by fleets being displaced into their usual fishing grounds. These impacts have not been quantified because there is no robust, verifiable scientific evidence and it is too speculative for a robust methodology to be developed to enable this to be calculated.
7.38. Two consultation respondents challenged our cost estimates for the South Rigg and Queenie Corner MCZs on the basis that the Total Allowable Catch (TAC) for nephrops could be affected by designation. They suggested that designation of the sites may be considered to reduce the total area of seabed mud available to fishing, which could affect the stock estimate and TAC for this species, leading to higher costs to the industry than currently estimated. We have opted to not adapt the cost estimates in response to this issue for two reasons. Firstly, although advice from fisheries experts is that the stock estimate and TAC might be reduced in this manner, this has not happened as yet, despite 9.3% of the region’s mud already being incorporated into MPAs. Any possible loss of TAC in relation to these two sites would just be in proportion to the 2.8% of the region’s mud that they contain. Secondly, only 74% of the original TAC for this nephrops fishery has been utilised by the average annual catch during the years 2013-17. As such, even if in future the calculation of the TAC were to take into account areas of MPAs closed to fishing, any reduction to the TAC is unlikely to have an impact on the amount of nephrops caught, unless fishing patterns change significantly.

7.39. After consideration of the above consultation responses and updated fisheries data, the best estimate undiscounted average annual cost for commercial fisheries (UK) has risen from £0.111m pre-consultation to £0.114m post-consultation.

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

7.40. Impacts of management measures on non-UK vessels have been taken into account in decision making. This has particularly been the case for offshore sites as, within membership of the EU, offshore management measures have to be agreed at the EU level in conjunction with the CFP. However these impacts are not included in the assessment of costs of designation in the summary sheets. This is because costs and benefits of regulatory changes to other countries are not considered in UK IAs and this is consistent with IA methodology and guidance. In addition, it is not possible or proportionate to assess lost GVA for other countries as each country will have different GVA ratios for different gear types and this information is not easily accessible.

7.41. Efforts have been made during the pre-consultation period to engage with the authorities and commercial stakeholders in affected member states. This has resulted in estimates of non-UK baseline revenues by gear type for each offshore and inshore site. Actual impacts on non-UK vessels will depend on profits obtained from MCZ areas and the ability of vessels to displace to surrounding areas in the event of management. A discussion of the likely impacts of each site on non-UK vessels is given in Annex E.

7.42. During consultation, four responses were received from authorities and commercial stakeholders in the affected member states. Some responses provided updated activity information but no updated cost estimates were provided and no specific issues were raised concerning the assumptions and methods used to calculate costs. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed.

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

7.43. The oil and gas sector is subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. The 3rd tranche of MCZs includes sites which may be in areas of future oil and gas exploration (not current consented activity). Following informal preliminary consultation with relevant parties, the impact of oil, gas and CCS on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by BEIS. As already highlighted in Section 7.11, the IA assumes that there will be an additional cost in
future licence applications due to the presence of MCZs which are the ‘nearest environmentally designated area’ for oil and gas licensable activity seeking consent. Different estimates of the number of future licence applications over the IA period were used to estimate low, best (or midpoint) and high cost estimates for the IA. This reflects uncertainty in the number of future licence applications that could come forward in blocks, with no known discoveries over the IA period, as identified through discussions with relevant parties. The estimates of future licences have not changed since previous IA tranches as regulatory authorities indicated they are content with these assumptions. Annex D provides more details on how costs for the 3rd tranche were derived.

7.44. For the purposes of the IA it is assumed that MCZ habitats and species that are already recognised within EU or national lists (see Section 6.1) are already protected and mitigated for outside of MCZs. Additional mitigation would be required for broad scale habitats, which are not protected under other legislation. The footprint of oil and gas and CCS developments and their pipelines and cables are unlikely to significantly impact on the overall condition of the broad scale habitat, therefore it is assumed that no additional mitigation required for this sector.

7.45. The number of applications that will be submitted during the 20-year IA period will be dependent on the number of blocks offered during oil and gas licensing rounds, and the stages of development that are carried out in each of those blocks over the 20-year IA period. For the 1st tranche IA, costs were scaled down based on the number of 1st tranche MCZs as a proportion of the whole suite of potential MCZs. The same approach was taken for the 2nd and 3rd tranches, but with some minor changes in assumptions. The main differences in the 3rd tranche apply to assumptions made behind the 26th, 27th, 28th, 29th, 30th and 31st rounds blocks. Annex D provides detailed information regarding the way in which these costs were ascertained. Also for this tranche, only two scenarios are envisaged and relative assumptions, consistent with the previous tranches, are described in Annex D (best and low cost scenarios). Consultation responses did not highlight any issues associated with the derivation of these costs, and further liaison with relevant departments, i.e. Oil and Gas Authority (OGA), confirmed their satisfaction with the existing assumptions used (pers. comm. 2019).

7.46. Given the increased number of licensing rounds assumed to be affected, best estimate undiscounted average annual cost for oil and gas have risen from £0.091m pre-consultation to £0.140m post-consultation. Note that the pre-consultation figure has been uprated to 2016 prices and therefore differs from the pre-consultation IA.

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

7.47. The ports and harbours sector is subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. The 3rd tranche of MCZs contains sites that encompass ports and harbours, sites that include areas under ports and harbours operational jurisdictions and/or sites overlapping or in close proximity to disposal sites and navigational dredging activity. It is assumed that the impact of ports activity on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO.

7.48. The IA assumes that there will be an additional cost to licence applications due to MCZs, with four scenarios developed to capture the range of likely costs. Such costs are associated with seeking consent for future ports and harbour activities including navigational dredging, disposal of dredge material at sea, and port and harbour developments. The scenarios vary in terms of estimates of future disposal activity and different numbers of future Marine Dredging Protocols, to give low and high cost
estimates. After consultation with the MMO and Cefas, it has been agreed that the best estimate is the midpoint of the two lowest cost scenarios, which in their view is most realistic based on the regulatory experience of the number of historical applications received. Annex D gives further details.

7.49. For disposal sites, the low cost assumes that an individual applicant will incur a maximum of one additional cost per calendar year to consider potential effects on MCZ broad scale habitats (per disposal site). This is because several disposal sites are frequently used by the same business, meaning additional assessment costs per application is not a realistic assumption as information on the MCZ would only have to be gathered once and then updated periodically. This is considered more realistic due to economies of scale, as businesses with multiple applications will only have to collect information on the MCZ once per year and use it again. Consequently the average number of annual future licence applications that would incur an additional cost, was assumed to be the same as the average number of licence applicants per year received over the period 2005 to 2015, using data provided by Cefas. However the high cost uses a more pessimistic assumption, where every application will incur an additional cost to consider potential effects on MCZ broad scale habitats, regardless of whether they include multiple applications by the same applicant. But this is considered highly unlikely (MMO pers. comm. 2014).

7.50. For navigational dredging, it was assumed that one maintenance licence application (renewal) is submitted for each navigational dredge area once every three years from year one of the period covered by the IA.

7.51. Planned future port and harbour developments were identified via discussions with port and harbour operators during the development of the 1st and 2nd tranche IAs, and during pre-consultation engagement for the 3rd tranche. Where appropriate, tranche 3 sites have been adapted to reduce or remove the need for port mitigations, and as a result no mitigation has been identified for any 3rd tranche MCZs.

7.52. Two consultation respondents raised concerns about potential economic and shipping safety impacts if the Saltmead anchorage within the Yarmouth to Cowes MCZ could no longer be used. Advice from SNCBs indicates that management of the Saltmead anchorage is unlikely to be required.

7.53. After consideration of the above, the best estimate undiscounted average annual cost for ports and harbours has risen from £0.116m pre-consultation to £0.117m post-consultation.

Recreation – Best estimate undiscounted average annual cost £0.287m

7.54. The recreation sector is subject to additional costs due to restrictions on either the equipment businesses may use, or areas in which the businesses may operate. Recreational activities considered in this IA include: angling, boating, snorkelling and shore-based activities such as coastal walking. While some recreation businesses may own multiple boats, it is prudent to assume that all businesses in this sector are small and micro for the purposes of the IA. The majority of these activities will not be negatively impacted by the designation of MCZs and many may even benefit from them (e.g. as seabed habitats and species recover there will be improved snorkelling and angling opportunities).

7.55. Potential management scenarios have been identified for each MCZ (over and above the baseline situation) based on updated information on feature extent and condition provided by Natural England and JNCC in relation to recreational activities that may need to be managed to achieve the conservation objectives of each MCZ. Where multiple
management scenarios are present for an MCZ, the best estimate is the mid-point of the
low and the high cost scenarios. These assumptions have been used for the purposes of
the IA to estimate the potential economic impacts of MCZs on the sector50.

7.56. In general, most recreational activities will not interfere with the achievement of the
conservation objectives of MCZs and would not need to be managed in the event of
designation. However, some features are sensitive to certain recreational activities, such
as anchoring and mooring, and therefore recreational boating may have to be managed if
such features (particularly seagrass) have a recover GMA. Where recreational anchoring
or mooring require management, scenarios to remove or mitigate the impacts of the
activity on sensitive features are adopted. Potential management can range from
voluntary codes of practice and no-anchor zones to mandatory no-anchor zones and the
use of eco-moorings to prevent abrasion damage to sensitive features. Only three sites in
the 3rd tranche contain features likely to require protection from mooring and anchoring:
Cumbria Coast, Studland Bay and Bembridge. For Cumbria Coast, the costs of a
possible code of conduct could not be quantified. More information about impacts and
costs for Studland Bay and Bembridge can be found in Annexes A and D.

7.57. Following discussion with stakeholders and information received during the formal
consultation, socioeconomic impacts on chartered vessel sea angling activities have now
been quantified for the three sites in which black sea bream will be protected (Purbeck
Coast, Poole Rocks and Southbourne Rough). This has resulted in an additional best
estimate annual cost of £0.118m to the recreation sector. This estimate reflects the
uniqueness of black bream nesting sites and the low opportunities for displacement to
other locations for recreational fishers, compared to, for instance, commercial fishers.
This estimate is based upon the best available evidence, however some uncertainties
exist. Further details are given in Annex D.

7.58. After consideration of the above, the best estimate undiscounted average annual cost to
the recreation sector has risen from £0.095m pre-consultation to £0.287m post-
consultation. It should be noted that despite high annual costs monetised in this IA, the
benefits to recreation are predicted to be higher, although it has not been possible to
monetise these. See Section 8 for more details.

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

7.59. The renewable energy sector is subject to additional costs due to assessment of
environmental impacts undertaken in support of future licence applications. The
renewable energy sector includes wind, wave and tidal power developments. It is
assumed that the impact of renewable energy developments on MCZ features will be
managed under the existing marine licensing framework, as provided for under the
MCAA and administered by the MMO.

7.60. The assumptions for this sector were based on advice from Natural England, JNCC, the
MMO and BEIS in terms of how these bodies anticipate their advice to developers would
differ for consents in the presence of an MCZ, and also on discussion with developers
during consideration of tranche 2 sites. This represents what actions they would expect
of the developer over and above the assessment of environmental impact that is already
undertaken in the absence of an MCZ, which includes the assessment of impacts on
broad scale habitats that are not protected under other legislation51.

7.61. Additional costs apply to all future renewable energy proposals in English waters ‘near to’ proposed MCZs (defined here as within 0.6 miles [1 km] of an MCZ boundary). This is different to the assumption made in the tranche 1 and tranche 2 IAs, which assumed an additional cost would only be incurred for developments that overlap or pass through MCZs. This change follows the publication of MMO guidance\(^52\) confirming that the assumption should be extended to include development ‘near to’ proposed MCZs.

7.62. After consideration of the above, the best estimate undiscounted average annual cost for renewables has not changed. This is because new renewable developments raised were predicted not to require further environmental assessments, were not in close proximity to sites, or both. The existing assumptions have been used.

### Summary of Public Sector Costs Methodologies

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

7.63. It is assumed that the potential impact of FCERM activities on features protected by MCZs will be managed under the existing marine licensing framework, as provided for under the MCAA 2009. The estimated impact is based on site-specific projects near MCZs that are likely to incur an additional cost for future FCERM licence applications, which are anticipated to result in additional monitoring or mitigation costs for operators (the Environment Agency and/or Local Authorities). Advice for each MCZ was provided based on an assessment of whether the proposed FCERM activity is: a) likely to take place in the site; b) likely to take place near to sensitive MCZ features; and c) whether the scale and type of FCERM activity anticipated would impact on the conservation objectives of the MCZ features\(^53\).

7.64. For the 3rd tranche of MCZ designations, there is no indication that planned FCERM developments will be impacted by the sites to be designated. The Environment Agency (pers. coms. 2012 & confirmed in 2017) have previously indicated that there may be additional costs to assess the impact on MCZs during some future licence applications. However, as future FCERM activities are not known there is uncertainty around the number of applications affected. As a consequence, at this stage, the assumption is that there are no extra costs for this 3rd tranche.

7.65. During consultation, no issues were raised concerning the estimation of costs to FCERM. Therefore, the same assumptions have been applied as pre-consultation.

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

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

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7.67. These costs were calculated on the basis of the MCZ network as a whole, and for the 1st and 2nd tranche IAs they were scaled down to the proportion of sites included in each tranche. The same approach was taken for the 3rd tranche. This methodology was agreed with the MoD and updated costs for officers’ time were provided during the pre-consultation period (pers. comm. 2017).

7.68. During consultation, no issues were raised concerning the estimation of costs to national defence. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed, bar uprating to 2016 prices.

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

7.69. Cost estimates are provided for implementing and enforcing management measures (when known) for tranche 3 sites where it is assumed that recreational or fishing activity requires additional management. Depending on the distance of the MCZ from the coastline, the responsibility to implement and enforce management measures falls to either the IFCAs or the MMO. For sites up to 6nm from the coastline, the IFCAs are responsible for managing fishing activity and the MMO are responsible for managing recreational activity. For sites beyond 6nm, the MMO are responsible for the implementation and enforcement of all management measures.

7.70. For the 3rd tranche sites, likely management scenarios have been updated following advice from the SNCBs and management cost assumptions have been updated following engagement with the MMO and IFCAs during the pre-consultation period (pers. comm. 2017).

7.71. Following correspondence with the MMO (pers. comm. 2018), the cost of Royal Navy inspections has been raised from £750-£1000 to £2,116. Best, low and high estimates have been updated to reflect this.

7.72. After consideration of the above, the best estimate undiscounted average annual cost for management has risen from £1.598m pre-consultation to £1.658m post-consultation. Note that the pre-consultation figure has been uprated to 2016 prices and therefore differs from the pre-consultation IA.

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

7.73. Once designated, the Secretary of State has a duty to report to Parliament every six years on the extent to which the conservation objectives for each MCZ have been achieved, and the extent to which the MPA network as a whole contributes to the conservation and/or improvement of the UK marine environment. To accomplish this, the SNCBs may be required to carry out ecological surveys of sites to monitor feature condition. For the 3rd tranche designations, Natural England has supplied costs for inshore sites (up to 12nm) and JNCC has provided costs for offshore sites (beyond 12nm) (pers. comm. 2018). These costs have been applied as appropriate and more information is provided in Annex D.

7.74. During consultation, no issues were raised concerning the estimation of costs for ecological surveys. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed, bar uprating to 2016 prices.
Anticipated costs to human activities that will be impacted by the 3rd tranche of MCZ designations

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

Table 2: Present value costs and average annual undiscounted costs\(^5\) of the 3rd tranche of MCZs

<table>
<thead>
<tr>
<th>Private Sector</th>
<th>Methodology, assumptions and sources</th>
<th>Best estimate scenario costs</th>
<th>Low / High cost scenarios</th>
</tr>
</thead>
</table>
| Aggregate extraction | - Aggregate extraction activity in or near proposed MCZs was mapped.  
- Licence applications within 0.6 miles (1 km) of an MCZ incur additional cost to assess potential impact of activity.  
- During the Regional MCZ Project in 2011, consultation with industry and the British Marine Aggregates Producers Association (BMAPA) provided an estimate of the additional cost per licence application. This cost is for assessing the impact on MCZ features, as required by the BMAPA biodiversity action plan. The estimate was determined from the expected additional consultancy fees (external costs) and developer time (internal cost, including overheads). Updated to 2016 prices the additional cost per licence application is estimated to be £0.028m.  
- The Crown Estate (pers. comm. 2017) and BMAPA (pers. comm. 2017) advised when existing licences are likely to be renewed and the expected number of licence applications in strategic resource areas over the 20-year IA period. | PV: £0.074m
Annual average: £0.006m/yr | PV: £0.0.74m – £0.114m
Annual average: £0.006m/yr - £0.007m/yr |

There is expected to be 4 licence applications within existing marine aggregate option or production areas during the 20-year IA time period (at an additional one-off cost of £0.028m for each application). Each licence is renewed after 15 years.

\(^5\) These costs are additional to the baseline (i.e. attributable to MCZs) and represent full financial costs (includes wages, overheads and NI) averaged over 20 years. Figures include transitional and annual costs. Annex D contains more detail on sector and site specific costs.
Aquaculture activity in and near each proposed MCZ was mapped during the Regional MCZ Project process and updated during local pre-consultation engagement. Scenarios were identified for each MCZ that make assumptions about the management that may be required to achieve the conservation objectives of the protected features. Aquaculture may need to be managed at one site (Dart Estuary). It was established that the remaining sites do not have aquaculture activity in close proximity or would have no impact on the protected features.

<table>
<thead>
<tr>
<th>Private sector</th>
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</thead>
</table>
| Cables         | - Existing cables and known future cable routes were mapped. It is assumed there will be an additional cost to operators for assessing impacts of future cable installation on broad scale habitats protected by an MCZ. 7.24. The specific locations of all future cable routes are not known, the number of potential licence applications was calculated for all MCZs and scaled down proportionally for the sites in this tranche. Increased cost to operators for the additional assessment of environmental impact upon MCZ features (broad scale habitats only) was estimated to be £10,561 per licence application for one future cable installation, based on cost estimates provided by industry. | **PV: £0.030m**  
Annual average: £0.002m/yr  
4 new licence applications in each of the years 2022, 2027, 2032 and 2037 (total 16 licences over 20 years) for the 99 inshore sites initially proposed by the Regional MCZ Project process. This was scaled down proportionally for the inshore sites recommended for designation in this IA (including those which are partially within 12nm). Existing or operational cables will not be impacted upon by MCZs. | **PV: £0.015m – £0.045m**  
Annual average: £0.001m/yr - £0.003m/yr  
Sensitivity around the number of licence applications over 20 years **Low cost scenario:** 2 licence applications in each year of 2022, 2027, 2032 and 2037 (total of 8 licences over 20 years) for 99 sites, This was scaled down for the sites to be designated resulting in costs of £0.004m in each of the above mentioned years. **High cost scenario:** 6 licence applications each year of 2022, 2027, 2032 and 2037 (total of 24 licences over 20 years). |
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<tr>
<th>Coastal Development</th>
<th>Costs monetised elsewhere</th>
<th>N/A</th>
</tr>
</thead>
</table>
| - Known coastal developments were mapped for each MCZ and assessed for potential impact on conservation objectives.  
- No impacts or mitigation are anticipated as these are monetised elsewhere (e.g. ports and harbours). | Competent authorities were not in the position to estimate the types and number of future licence applications. Additionally, costs associated with some developments are covered under sector-specific costs such as ports and harbours and renewables. It is therefore expected that costs of other coastal development activities will be small. | |

| Commercial Fisheries (UK) | PV: £1.681m  
Annual average: £0.114m/yr | PV: £0.000m - £14.087m  
Annual average: £0.000m/yr - £0.958m/yr |
|--------------------------|--------------------------|--------------------------|
| - Estimates of fishing activity in each MCZ uses methodology from the MCZ fisheries model.  
- Value of landing information provided by VMS data for over 15m vessels (2013-2017 data) and IFCA and MMO inshore sightings data for under 15m vessels (2010-2014 data).  
- Costs are due to management of some fishing activities. Gear types affected and management required are specific to the site and the feature which the MCZ is designated to protect. Management scenarios for each MCZ are summarised in Annex A.  
- Costs are measured as loss in GVA, i.e. the value of landings associated with the relevant area of fishing grounds, minus costs associated with these landings. This is not directly comparable to revenue lost.  
- The default of 75% displacement (and 25% loss) of fishing activity is based on low overlap of the MCZs with core fishing grounds. | The best estimate for each gear type is either the mid-point of the high and low management scenarios for each site for ‘mobile’ gears (assumed bottom trawls and dredges) or 25% of the range of management scenarios for ‘static’ gears (pots & traps, nets, hooks and lines) (detailed in Annex A). This is based on the assumption that static gears are less likely to face the most stringent management option for sites because their impact on the features proposed for designation are generally less than bottom-abrading mobile gears.  
Sensitivity takes into account a range of management scenarios and displacement assumptions included:  
**Low cost scenario:** Lowest potential management scenario.  
**High cost scenario:** Numerous displacement percentages were considered. The highest potential management scenario, with no displacement of fishing to other areas, i.e. 100% of overlapping fishing GVA is lost |
<table>
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<tr>
<th>Private sector</th>
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| Heritage Assets | - During previous tranches, archaeological data was 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.  
- Diver trails, visitors and non-intrusive surveys will be unaffected in MCZs.  
- Vessels can no longer anchor over sensitive features such as seagrass beds. | **No extra costs quantified**  
No information about future licence applications or suitable historical data with which to forecast future activities was obtained during pre-consultation or formal consultation. | N/A |
| Oil & Gas & other energy (including Carbon Capture and Storage (CCS) at sea) | - Current activity was mapped (including 26th, 27th, 28th, 29th, 30th and 31st rounds) and potential future oil & gas developments have been assessed in each MCZ project area.  
- It is assumed there will be additional costs for licence applications due to the additional assessment of environmental impacts. The costs derive from increased developer time (internal costs, including overheads) and external costs required to complete the assessment.  
- Estimates of additional costs were provided by industry representatives during the Regional MCZ Project process in 2011, and have been uprated to 2016 prices. At the discretion of industry the costs comprise a combination of external consultant costs and internal time.  
- Costs are calculated based on the 127 Regional Project MCZs and scaled down to | **PV: £2.105m**  
**Annual average: £0.140m/yr**  
Costs are based on additional application costs for different phases in oil, gas and CCS developments and the number of such activities likely to be affected by sites in the 3rd tranche. | PV: £1.565m – £2.518m  
**Annual average: £0.105m/yr - £0.166m/yr**  
Sensitivity around the number of future licence applications.  
**Low cost scenario:** Calculated using an estimate of the total number of future licence applications in blocks in the 26th round with a ‘significant discovery’ or ‘fallow block with discovery’ that is 25% lower than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed to be 50% less than the number used to calculate the best estimate.  
**High cost scenario:** Calculated |
<table>
<thead>
<tr>
<th>Ports, Harbours, Commercial Shipping and Disposal Sites</th>
<th>account only for the 3rd tranche.</th>
<th>using an estimate of the total number of future licence applications in blocks in the 26th round with a ‘significant discovery’ or ‘fallow block with discovery’ that is 25% higher than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed to be 50% higher than the number used to calculate the best estimate.</th>
</tr>
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<tbody>
<tr>
<td>- Current activity was mapped (i.e. ports, harbours, disposal sites and navigational dredges).</td>
<td>PV: £1.746m Annual average: £0.117m/yr</td>
<td>PV: £1.702m – £5.843m Annual average: £0.114m/yr - £0.396m/yr</td>
</tr>
<tr>
<td>- Additional one-off cost will be incurred for future licence applications for ports development, disposal sites and navigational dredging</td>
<td>The best estimate is the mid-point of the two low cost scenarios</td>
<td>Sensitivity around disposal sites application numbers, the assessment cost per future licence application and the number of marine dredging protocols (MDPs).</td>
</tr>
<tr>
<td>- The crown estate for previous tranches (pers. comm. 2011) identified the navigational dredging areas within 3.1 miles (5 km) of an MCZ, as well as updated information during the formal consultation period (pers. comm. 2018). Licences for each area is assumed to require renewal once every three years from the first year of the IA. This information still applies.</td>
<td></td>
<td><strong>Low cost scenario:</strong> Cost for disposal site applications is based on number of applicants, as individual applicants will incur a maximum of one additional cost per calendar year, irrespective of the number of applications made. This scenario assumes that 36 MDPs are in place in England and that MDPs will be used in support of 55% of future navigational dredging licence applications, whilst the remaining 45% will not be supported by MDPs. The lowest cost per licence application is used.</td>
</tr>
<tr>
<td>- Future port developments and disposal site licence applications are derived the number of past applications</td>
<td></td>
<td><strong>High cost scenario:</strong> Cost for disposal site applications is based on a fixed cost per application, as individual applicants will incur a maximum of one additional cost per calendar year, irrespective of the number of applications made. This scenario assumes that 36 MDPs are in place in England and that MDPs will be used in support of 55% of future navigational dredging licence applications, whilst the remaining 45% will not be supported by MDPs. The highest cost per licence application is used.</td>
</tr>
<tr>
<td>- Unit cost estimates were provided by industry. This includes external costs for consultants (based on the two estimates from two UK environmental consultancy firms).</td>
<td></td>
<td></td>
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<tr>
<td>- Consultation with SNCBs has not identified</td>
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any mitigation requirements relevant to the Ports and Harbour sector

- Four scenarios were developed, two are low cost which use the lowest unit cost estimates and assume that each dredging applicant will incur one cost per year regardless of the number of licence applications made, whilst the other two are high cost as they consider a higher unit cost and assume each application will incur a cost. The two scenarios in each group are differentiated by the number of MDPs55 in place and the percentage of navigational dredging applications that are supported by an MDP.

- MDPs potentially present cost savings, hence the low cost scenario is the scenario in the low cost group, which assumes a higher number of MDPs and the high cost scenario is the scenario in the high cost group that assumes the lower number of MDPs.

Recreation

- Recreational activity in and near each MCZ was mapped as part of the Regional MCZ Project process and updated through local engagement during pre-consultation, alongside vulnerability assessments56 of the sensitivity of features to the activities taking place.

- Anchoring and mooring need to be managed

<table>
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<tr>
<th>High cost scenario: Costs for disposal site applications is based on number of applications rather than applicants. This scenario assumes that 12 MDPs are in place in England and that MDPs will be used in support of 30% of future navigational dredging licence applications, whilst the remaining 70% will not be supported by MDPs. The highest cost per licence application is used.</th>
</tr>
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</table>
| PV: £4.236m
Annual average: £0.287m/yr

The best estimate of the impact is taken as the average of the lowest and highest cost scenarios

PV: £0.410m – £18.682m
Annual average: £0.026m/yr - £1.270m/yr

A range of management scenarios have been developed and they depend on the issue under consideration.

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55 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.

56 A vulnerability assessment takes into account information on certain activities in an area (e.g. fishing and recreational activity) alongside best available science on the sensitivity of features to activities. Stakeholders were given the chance to amend assumptions based on local knowledge.
at two sites (Studland Bay and Bembridge) due to the presence of features that need to recover as per SNBC advice. Anchoring and mooring may be subject to a voluntary code of conduct at Cumbria Coast, however this has not been quantified. See Annex A for management scenarios for sites.

- The costs incurred by the chartered vessels sector as a result of black sea bream protection at Poole Rocks, Purbeck Coast and Southbourne Rough MCZs has been included. Further details are given in Annex D.

<table>
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<tr>
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<th>Best estimate scenario costs</th>
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</thead>
</table>
| Renewable Energy | - Costs apply to all renewable energy developers seeking planning consent for renewable energy proposals in English waters ‘near to’ MCZs (defined as within 0.6 miles [1 km] of the MCZ boundary). The additional cost is to assess potential impact of activity.  
- The Crown Estate and MMO provided information on potential future developments within the next 20 years  
- The 3rd tranche of MCZs includes sites which overlap or are in proximity to yet-to-be consented wave and tidal marine renewable energy developments. No yet-to-be consented wind developments were identified to be within 0.6 miles (1 km) of the tranche 3 sites. | **PV: £0.0.074m**  
**Annual average: £0.005m/yr**  
The best estimate is costs to wind, wave and tidal developments for additional EIA costs during licence applications. | No sensitivity  
A high cost scenario was considered, which would include any additional one-off costs that arise from mitigating the impact of future renewable energy cables. However Crown Estate data (pers. comm. 2016) did not identify any yet to be consented renewable energy cables to pass through the proposed MCZs. Advice during the formal consultation (pers. comm. 2018) referred to new developments, however this did not affect our assumptions as the new developments were in line with agreed predictions as to the rate of future development. Therefore there
<table>
<thead>
<tr>
<th>Public Sector</th>
<th>Methodology, assumptions and sources</th>
<th>Best estimate scenario</th>
<th>Low / High cost scenarios</th>
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</thead>
</table>
| Flood and coastal erosion risk management | - MCZs were assessed in relation to proposals in Shoreline Management Plans (SMPs).  
- No costs have been identified as a result of the sites to be designated in the 3rd tranche for monitoring, additional assessment costs or mitigation of activities. This has been confirmed by the Environment Agency.  
- In the unlikely event that costs do arise, monetisation was not possible due to uncertainty regarding the number of licence applications, plus costs are likely to be low due to expectations of only minor mitigation activities. | No extra costs quantified        | N/A                         |
| National Defence      | - National Defence activity in and near to all proposed MCZs was assessed.  
- Costs provided by MoD (pers. comm. 2017).  
- Anticipated costs are calculated for the full network of MCZs and scaled down to represent the 3rd tranche.  
- Costs are generic and may differ depending on the scale and nature of the military activities in each MCZ. | PV: £0.050m  
Annual average: £0.003m/yr  
One-off cost of adjusting electronic tools and charts (£0.026m) and annual costs of maintaining (to ensure that MCZs are featured in planning for operations/ training) of £0.012m/yr in the first 4 years, reducing to £0.006m/yr for years 5-20 of IA period | N/A                         |
### Management and enforcement of MCZs

- Additional costs account for the implementation (e.g. byelaws, voluntary agreements) and enforcement of the indicative fisheries and recreation management scenarios outlined in Annex A.
  - Depending on the distance of the MCZ from the coastline, the responsibility to implement and enforce the management of these activities falls to one of three public authority: the MMO, IFCAs and Defra.
  - Cost estimates were provided by IFCAs, MMO and Defra.
  - Estimates don’t take account of possible cost savings of introducing one management measure that covers multiple MCZs or risk-based prioritisation of monitoring.

**PV:** £24.453m  
**Annual average:** £1.658m/yr

Best estimate is the midpoint of the high and low cost scenarios.

**PV:** £20.188m – £28.719m  
**Annual average:** £1.370m/yr - £1.946m/yr

Sensitivity around management.  
**Low cost scenario:** Covers both non-regulatory and regulatory management measures.  
**High cost scenario:** Covers only regulatory management measures. Both assume that only regulatory measures will be implemented in MCZs outside 6nm for commercial fisheries. This is because it is assumed it is impractical to implement non-regulatory measures such as voluntary agreements outside these limits.

### Ecological Surveys

- Annual costs for ecological surveys for baseline surveys and monitoring only.
  - Costs for offshore sites are based on similar surveys and provided by JNCC.
  - Costs for inshore sites are based on cost estimates provided by Natural England and applied to the number of features in each site.

**PV:** £36.175m  
**Annual average:** £2.460m/yr

No sensitivity.

Following investigation by Natural England of the spatial overlaps of MCZs and SACs it has been agreed to remove the previous assumption that a 50% overlap of designation types would incur a 50% cost saving.

### Non-UK

<table>
<thead>
<tr>
<th>Methodology and sources</th>
<th>Best estimate scenario</th>
<th>Low / High cost scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-UK</td>
<td>Figures for non-UK vessels were gathered</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Total public PV costs:**  
| Total public PV costs: | £60.681m  
| **Total average annual public costs:** | £4.121m  

**Total public PV costs:**  
| Total public PV costs: | £56.416m - £64.946m  
| **Total average annual public costs:** | £3.833m - £4.409m  

| Total public PV costs: | £20.188m – £28.719m  
| **Total average annual public costs:** | £1.370m/yr - £1.946m/yr  

Sensitivity around management.  
**Low cost scenario:** Covers both non-regulatory and regulatory management measures.  
**High cost scenario:** Covers only regulatory management measures. Both assume that only regulatory measures will be implemented in MCZs outside 6nm for commercial fisheries. This is because it is assumed it is impractical to implement non-regulatory measures such as voluntary agreements outside these limits.
| commercial fisheries vessels | during pre-consultation with all relevant member states.  
- These costs are not included in the summary figures or the EANCB calculation, but informed decisions on site selection.  
- 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. |
Costs to Business (Equivalent Annual Direct Net Costs Business)

7.75. Costs to business have been calculated in line with the Better Regulation Framework\(^57\). These are calculated as full economic costs. Figures have been provided directly by industry during the two years of informal consultation as part of the Regional MCZ Projects process, during the tranche 3 pre-consultation period, and during formal consultation. When necessary figures from the previous tranches’ consultations were considered and uprated to 2016 prices. External costs (i.e. costs for additional consultant time) use the mid-point of a range of quotes from UK consultancy firms. Internal costs have been provided by industry themselves and calculated in line with the HMT Green Book and Standard Cost Model methodology, i.e. they incorporate wage costs as well as overheads plus national insurance. Some figures are not split into external and internal costs, but the full figure was provided at the discretion of industry or validated by industry, incorporating full costs. Details of assumptions, actual calculations of unit costs and the time profile of costs used are given in Annex D.

7.76. Assumptions had to be made on e.g. the number of licence applications and likely mitigation. This was verified with industry representatives on a case-by-case basis. This uncertainty is also tested in the sensitivity analysis, as described in Table 2. Depending on the sector, the site and the likelihood of mitigation, the best estimate is either the low cost scenario, high cost, or a weighted average of low and high cost scenarios. This has been agreed with industry for each sector and is described in Table 2.

7.77. These figures are illustrative only, based on potential scenarios of costs. Decisions on the actual management (and resulting costs) will be taken on a site-by-site basis by the MMO and IFCAs, including consultation with stakeholders and if required an associated regulatory IA. The costs presented provide a best estimate of what these costs may be.

7.78. Within the baseline option it is assumed that existing government policies and commitments related to the marine environment are fully implemented and achieve their desired goals. Particularly significant are commitments to implementation of the Environmental Impact Assessment Directive and the Water Framework Directive (or equivalent national regulations). In light of this, the IA assumes that no mitigation of impacts of water abstraction, discharge or diffuse pollutions is required over and above that which will be provided to achieve the objectives of the Water Framework Directive (or equivalent national regulations) through the River Basin Management Plan process.

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

Risks, sensitivities and limitations of costs methodology

7.79. The sectoral approach adopted makes it difficult to make links between sectors, which may mean that benefits (and reduction in costs) of co-location are missed, or potential additive impacts are not quantified. This is likely to be an issue for a very small number of sites only and has been discussed at a site-level, with no adjustment in cost data due to uncertainty.

7.80. For many sectors, including oil & gas, national defence, and aspects of renewable energy, some of the assumptions for this IA cannot be site-specific, because in most circumstances it is not yet known where future developments will be or what they will

comprise. Assumptions and results of sensitivity analyses have been taken at a regional level and verified with relevant industry representatives\textsuperscript{58}.

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

**Small and Micro Business Impact Assessment**

7.82. The sectors which will be directly managed as a result of the designation of MCZs are fisheries and potentially recreation through restrictions on anchoring and mooring over sensitive features. These sectors are made up almost entirely of small and micro businesses as they are generally individual boat owners with no or small crews and local yacht and sailing clubs.

7.83. The recreational sector may face restrictions at six sites: Cumbria Coast, Studland Bay, Bembridge, Poole Rocks, Purbeck Coast and Southbourne Rough. While some recreation businesses may own multiple boats, it is prudent to assume that all businesses in this sector are small and micro for the purposes of the IA. Management scenarios have been developed for these sites based on advice derived in consultation with the MMO, the Royal Yachting Association (RYA) and Natural England, and these are provided in Annex A. The costs incurred by the chartered vessels sector as a result of black sea bream protection at Poole Rocks, Purbeck Coast and Southbourne Rough MCZs have been included. Further details are given in Annex D. It is not appropriate to exclude these businesses from management measures, as by doing so it would not be possible to achieve the conservation objectives of the proposed sites.

7.84. The UK commercial fishing sector will face restrictions at a number of sites. While some fishing businesses may own multiple boats, it is prudent to assume that all businesses in this sector are small and micro for the purposes of the IA. Therefore the best estimate cost of £0.114m/yr to UK commercial fisheries is assumed to fall entirely on small and micro businesses. It is not appropriate to exclude these businesses from management measures, as by doing so it would not be possible to achieve the conservation objectives of the tranche 3 sites.

7.85. In 2017, the UK fishing fleet had 6,148 vessels and employed 11,692 fishermen (MMO 2017\textsuperscript{59}). Statistics are provided on a devolved administration basis but in reality Scottish vessels will fish English inshore and English, Welsh and Northern Irish offshore waters and vice versa so all these vessels are potentially in scope. UK vessels landed 708 thousand tonnes of sea fish (including shellfish) into the UK and abroad with a value of £775 million in 2015 (MMO 2017).

7.86. Other sectors incurring additional costs to assess the impacts of their licensed activities on the conservation objectives of sites, are covered by existing licensing legislation. This legislation already contains its own exemptions and thresholds for different sized businesses and projects, which should limit the impacts on small and micro businesses. The main licensable sectors impacted, oil & gas and ports and harbours, are made up of

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\textsuperscript{58} 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.

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

8. Benefits under the baseline and preferred option

8.1. The marine environment provides us with many benefits, such as food in terms of wild and farmed fish and shellfish, and gives millions of people the chance to enjoy sailing, angling, watching birds and other wildlife and provides environmental resilience. These can be described as ‘Ecosystem Service’ benefits. Ecosystem services are defined as services provided by the natural environment that benefit people (Defra 2007), several of which can be considered public goods as discussed in Section 4.3. The UK National Ecosystem Assessment Follow-on study (NEAFO 2014) has underlined the value of the marine environment and benefits derived from its ecosystem services. The NEAFO recognised both the need to take proper account of the benefits of marine conservation measures in decision making but also the challenges and lack of economic evidence currently available for doing so.

8.2. More recently, Hanley and Torres (2016) carried out an extensive literature review on the economic valuation of coastal and marine ecosystem services. However, despite the increasing number of studies investigating the economic value of environmental protection, there is a lack of robust evidence on the economic benefits of MCZs specifically. This is due to the fact that the positive effects generated by the measures adopted are not likely to be fully realised for many years. Moreover, such studies are often subject to a number of limitations that means they cannot be directly compared with the quantification of costs. As such, this section contains illustrative benefits from the designation of tranche 3 MCZs using the latest available literature, most notably the Kenter et al. study (2013) described in Annex B.

8.3. The ecosystem services that may be provided by the marine environment (and MCZ features) have been assessed under the categories set out in Table 3 based on those in NEAFO work package 4 (figure 4.S.2 p.3).

<table>
<thead>
<tr>
<th>Table 3: Marine goods and benefits considered within the NEAFO study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General marine ecosystem service categorisation</strong></td>
</tr>
<tr>
<td>Provisioning</td>
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<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Regulating</td>
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<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

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60 http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=kLY76Rak0WO%3d&tabid=82
61 Adapted from the conceptual framework UK, NEA 2011
Benefits under baseline

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

<table>
<thead>
<tr>
<th>Provisioning</th>
<th>Food (wild, farmed)</th>
<th>In 2014, the GVA of fishing, including aquaculture, was £1.4bn. 62</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fish feed (wild, farmed, bait)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fertiliser and biofuels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ornaments and aquaria</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medicines and blue biotechnology</td>
<td></td>
</tr>
<tr>
<td>Regulating</td>
<td>Prevention of coastal erosion and sea defence</td>
<td>£1.5bn/yr total value of storm buffering and flood control (meta-analysis) 63; £300m 2004 value, avoidance cost of building flood control measures) 64</td>
</tr>
<tr>
<td></td>
<td>Healthy climate</td>
<td>£0.4-8.47bn yr 2002 values, avoidance cost; £6.74bn/yr marine carbon-sequestration 2004 value, avoidance cost 65</td>
</tr>
</tbody>
</table>

Table 4: Existing benefits of the UK marine environment (estimates are for the UK marine environment rather than specific to MCZs)

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

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

64 Beaumont et al., 2008

65 UK National ecosystem assessment (2011) and Beaumont et al. (2006), from Fletcher et al (2012a)
| nature watching | leisure visits were made to seaside/coastal areas in England\textsuperscript{66}. In 2015, 12.4m UK adults participated in water sports and other water-based leisure activities, including boating, sea angling and coastal walking.\textsuperscript{67} Willingness to pay for access to RSPB coastal reserves with visitor centres, a proxy for access to an MPA, is estimated at £9.18 per visit. Increased levels of wildlife biodiversity raised WTP to £9.71 per visit. This suggests there are economic benefits from the provision of educational infrastructure and of management measures to raise wildlife biodiversity (Paltriguera et al., 2018). |
| Education and research | An Oxford Economics (2013) report valued Marine Science and Marine Technical Consultancy in 2011 at £0.3bn and £0.5bn GVA respectively\textsuperscript{68}. |
| Spiritual and cultural well-being | Work package 4 of the NEAFO reviewed the literature on cultural ecosystem services and in 2012 prices derived willingness to pay figures per household in England of £75 per year to Holt loss of biodiversity and ecosystem services on the coastal shelf (McVittie & Moran 2010). This equates to £1.65bn if multiplied by the estimated 22m households in England in 2012. |
| Aesthetic benefits | |
| Health benefits | |

**Benefits of the preferred option (option 1)**

8.5. The designation of 41 MCZs and additional features from existing 1st and 2nd tranche sites will help to conserve and improve the range of biodiversity in UK waters as well as contribute to the productivity of the seas in the long term. A combined area of 7278 m\textsuperscript{2} will be protected by the designation of these 41 additional sites and 200 features will be conserved. Following designation, around 40% of English inshore and offshore waters will be protected, and the total for the UK as a whole will be almost 25%. These MCZ sites will complement other types of designation and will provide an essential component of the UK contribution to establishing an ecologically coherent network of MPAs. In the absence of MCZs, the full range of features present in the UK marine area would not be afforded protection.

8.6. MCZ designation brings benefits from:

- Flows of ecosystem services from specific features and habitats that MCZs will protect. Under the preferred option, only features that are in an unfavourable condition (and would continue to be unfavourable in the absence of MCZs) and have been assigned a ‘Recover’ GMA are considered to yield additional benefits\textsuperscript{69}.  

\textsuperscript{66} Monitor of Engagement with the Natural Environment 


\textsuperscript{68} http://www.oxfordeconomics.com/publication/open/239345

\textsuperscript{69} We understand that this will result in an underestimation of benefits as future damage to features currently in a favourable condition that may otherwise occur without the protection of the MCZs is not accounted for.
Similarly, some features are already protected by existing legislation and benefits from these features are not considered additional to MCZ designation unless they are offered a higher level of protection under MCZs.

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

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

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

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

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

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

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

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70 Results from the National Ecosystem Assessment marine work package 4 state that there is a huge lack of valuation evidence (primary evidence) in this area.
flow from additional features that are offered protection under MCZ designation and that will receive an increased level of protection through this. MCZ features with a recover GMA are expected to improve to favourable condition and features with a maintain GMA are expected to remain in favourable condition under MCZ designation.

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

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Description</th>
<th>Quantification/monetisation (where possible)</th>
<th>Confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-use/bequest values</td>
<td>People derive benefits from protecting features of sites even if they do not actually use them. These so called non-use values can comprise: option value (the value of retaining the possibility of using a site in the future, including the value of avoiding irreversibility (c.f. Arrow &amp; Fisher 1974; Farber, Costanza &amp; 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).</td>
<td>Based on Willingness to Pay estimates derived from Kenter et al71 ((see Annex C for more detailed information on the research methodology) the one-off non-use value of protecting the sites to divers and anglers alone is estimated at £180m to £345m (Best estimate £262m) to protect 30 of the designated sites: Further explanation on the estimates is provided in Box 3, Annex C and Sections 8.10 to 8.14</td>
<td>Med - High confidence in existence of features; relatively high confidence that there will be a non-use benefit (welfare increase). Low confidence in the scale of the benefits</td>
</tr>
<tr>
<td>Research and education</td>
<td>MCZ research and monitoring will contribute to our understanding of marine ecosystems and potential beneficial uses of marine species. Improvement in knowledge will support more effective marine planning and licensing in UK waters. The scale of research benefit depends on the scale of additional information gathered and the ability of information to enable better decisions to be made in the marine environment. There are specific research gaps in the effectiveness of MPAs in temperate areas and the role of biodiversity in ensuring the resilience of ecosystem service provision, to which these MCZs could contribute. Shore-accessible MCZs are likely to benefit the greatest number of people for educational purposes.</td>
<td>No new economic evidence since tranche 2. Estuaries, rocky bottom and coral reefs are of particular interest to researchers but designation of all features (GMA set at recover or maintain) is likely to improve the understanding of these ecosystem services</td>
<td>Med - High confidence in existence of features; relatively high confidence that there will be a benefit to research and education due to these designations</td>
</tr>
</tbody>
</table>

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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.

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

72 Regional MCZ Project Methodology Documents Annex H5; Rees et al. (2016).
73 Fletcher et al (2012a)
74 Hughes and others, 2005; Tilman, Reich and Knops, 2006; in Beaumont and others, 2008; Rees et al. 2016.)
| Gas and climate regulation | Certain habitats are efficient sequesters of carbon and contribute to gas and climate regulation. Management of MCZs may reduce human pressures on these habitats that may result in a net increase in the rate of carbon sequestration. | No new economic evidence considered since tranche 2. The 3rd tranche includes a number of features that are particularly efficient sequesters of carbon: intertidal mud, coastal salt marshes and saline reed beds, deep-sea bed and seagrass beds.  
Studies have valued the carbon benefit of certain relevant habitats in their entirety, for example, Beaumont et al. | High confidence in existence of features; medium confidence in impact on carbon sequestration. |

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75 OSPAR (2010)
76 Fletcher et al (2012a).
Andrews et al (2000) valued the carbon benefit of mudflat and salt marsh sediments at £12/ha/yr. However, MCZ designation will only change the quality of these habitats, rather than complete creation (or loss) of habitat. Carbon value relating to MCZ designation will therefore be lower for each of these habitats. Scientific evidence on the value of improving the condition of marine habitats is not available.

<table>
<thead>
<tr>
<th>Regulation of pollution (nutrient recycling)</th>
<th>MCZs also contribute to the regulation of pollution (nutrient recycling). To the extent that MCZs will contribute to healthier and more diverse ecosystems, they are anticipated to aid the environment’s capacity to process waste and protect the regulating capacity of the marine environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No new economic evidence considered since tranche 2. Subtidal sediment habitats can act as pollution sinks, aided by the fauna resident within them. Salt marshes and seagrass beds are thought to be particularly good regulators of pollution.</td>
<td></td>
</tr>
</tbody>
</table>

**Regulation of pollution (nutrient recycling)**

<table>
<thead>
<tr>
<th></th>
<th>(2010) valued saltmarshes at £6,100-62,200/km/yr. Andrews et al (2000) valued the carbon benefit of mudflat and salt marsh sediments at £12/ha/yr. However, MCZ designation will only change the quality of these habitats, rather than complete creation (or loss) of habitat. Carbon value relating to MCZ designation will therefore be lower for each of these habitats. Scientific evidence on the value of improving the condition of marine habitats is not available.</th>
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8.12. The evidence presented in Table 5 shows that many of the 3rd tranche features provide valuable ecosystem services, with resulting increases in human welfare, even though it has not been possible to fully quantify or monetise these benefits.

8.13. Some monetary values of MCZs have been estimated by Kenter et al (2013)79. This report investigated the recreational use and non-use values of UK divers and sea anglers for 22 Scottish potential Marine Protected Areas, 119 English recommended MCZs and 7 existing Welsh marine SACs using a combination of monetary and non-monetary valuation methods and an interactive mapping application to assess site visit numbers. The results are based on an online survey with 1683 divers and sea anglers run between December 2012 and January 2013.

8.14. The 3rd tranche of designations includes, along with the Regional MCZ Project sites, nine new sites in order to fill the remaining gaps in the network as well as sites to protect highly mobile species. These latter sites have not been included in the benefits calculations based on the Kenter et al. report, which only considered sites originally proposed for designation by Defra in 2011.

Box 3: Monetisation of recreational benefits

<table>
<thead>
<tr>
<th>Use and Non-use values – Willingness to pay by divers and anglers to protect designated marine areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural services that will be attributable to designation of sites have been assessed by a team of researchers from the University of Aberdeen in partnership with the Marine Conservation Society, British Sub Aqua Club (BSAC) and the Angling Trust (AT). Kenter et al carried out a case study on the value of marine protected areas to divers and anglers as part of the follow-on phase of the UK National Ecosystem Assessment, using a combination of primary valuation (online survey of anglers and divers) and benefits transfer, monetary (choice experiment and contingent valuation) and non-monetary valuation.</td>
</tr>
<tr>
<td>Based on their results per site (using contingent valuation method (CVM)), it is estimated that UK divers and anglers are willing to pay £180m to £345m (Best estimate £262m) one-off to protect 30 sites in 2016 prices. These estimates refer to non-use values obtained from the Kenter study but adjusted to the current 30 Regional MCZ Project sites. The authors state that their CVM design can be thought of as eliciting an insurance value. Donations requested from respondents can be thought of as a premium to pay for the avoidance of harm to environmental goods of value. They considered motivation for paying this premium to be associated with three sources of non-use value: option value (the value of retaining the possibility of using a site in the future, including the value of avoiding irreversibility of harm (c.f. Arrow &amp; Fisher 1974; Farber, Costanza &amp; 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</td>
</tr>
</tbody>
</table>

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

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79 Kenter et al (2013). The value of potential Marine Protected Areas in the UK to divers and sea anglers. UK National Ecosystem Assessment Follow-on.
restricting diving and angling). This value is only an indicative use value and is not adjusted to the 30 Regional MCZ Project sites.

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

8.15. The estimates in Box 3 and Annex C and Table 5 provide an indication that there are potentially high benefits for recreational users from protecting these sites. The results presented in Box 3 have not been adjusted to reflect new information on feature certainty or boundary changes made in the site consideration, nor diminishing returns considered in relation to the number of sites being designated. Uncertainty over the scale of benefits means they have not been used in the summary sheets.

8.16. Discussing limitations of the non-use estimates, Kenter et al. (2013) note there may be some framing bias in responses and that the use of a voluntary contribution payment vehicle may not fully reveal individual values. Also the respondents were asked to provide a hypothetical donation to a hypothetical site, which may result in bias of benefits (although budget constraints are emphasised) and the estimates value individual’s perception to restricting the sites rather than actual ecological protection following designation.

Anticipated overall benefits of a Marine Protected Area network

8.17. MPAs already exist in the form of SPAs, SACs, Sites of Special Scientific Interest (SSSI), Ramsar sites and 50 MCZs. The 3rd tranche MCZ sites have been selected to complement these sites and to contribute towards the overall MPA network. The full network of MPAs will protect a range of representative habitats and species, and a sufficient number of spatially distinct areas to offer resilience. There are additional overall benefits that go beyond the site-specific benefits described above.

8.18. By protecting a range of representative features from across the marine environment, the government is protecting biodiversity and the genetic diversity underpinning this. This creates biological resilience so that as conditions in the marine environment change, species and habitats remain that are able to adapt to these changed conditions. The replication of features and habitats safeguards against any loss and captures natural variation within features, hence increasing ecological resilience.

8.19. Alongside highly mobile marine mammal and bird species, mobile fish species are also likely to benefit from MPAs when these protect key life stages or provide areas where fishing pressure is reduced or removed. An improvement in conditions for mobile fish species is likely to benefit commercial fishermen and recreational anglers, as well as potentially increasing non-use value from knowledge that these species are being protected.
Consultation responses received on the benefits of MCZs

8.20. A number of consultation responses commented on the estimation of benefits in this IA. The main responses are summarised below:

- One respondent provided details of the effect of management measures implemented in Lyme Bay upon the provision of ecosystem services and the well-being of local fishermen. The results from this project have been included in Annex B.

- One respondent provided details of an estimated monetary value of an ecologically coherent network of Marine Protected Areas for Northern Ireland’s seas. Whilst the results are not specific to the proposed tranche of MCZs, the results from this project have been included in Annex B as an example of quantifying benefits.

- One respondent provided details of the high benefits and low private costs of closed area protection for scallops, relevant to the South Rigg, Queenie Corner and West of Copeland sites. Whilst the results do not quantify these benefits, they have been included in Annex B.

- One respondent provided details of significant non-monetary value for various sites, referencing Kenter et al. (2013). Benefits have been considered and have been used to support decisions. There is limited evidence on economic benefits on the marine and coastal environment suitable for adapting for use in benefits evaluation, however the Kenter et al. (2013) paper referenced by this respondent has been included in the impact assessment as an indicative assessment of the benefits; it makes clear that the benefits of designation are likely to be higher that the costs. The response did not provide additional evidence.

- A small number of respondents to the consultation stated that they were concerned about the use of a static baseline, which assumes no improvement or deterioration in feature condition without designation. They argued that given the pattern of historic deterioration in the marine environment, using a static baseline would mean that the benefits from designation would be underestimated. This IA continues to use a static baseline because we do not have site-specific evidence on where the condition of sites is changing, and therefore it would not be possible to provide an indication of the benefits of designation under a different baseline assumption. This is discussed in Section 6.

Risks, uncertainties and sensitivities

8.21. The IA assumes that features will continue to remain in their ‘favourable’ or ‘unfavourable’ condition over the 20 year period (i.e. their condition will not deteriorate or improve) and, consequently, the rationale behind the adoption of a static baseline. This is required due to uncertainty around future changes in human activities resulting in future changes to feature condition (see Sections 6 and 8.4). This could potentially underestimate the benefits outlined above.

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

8.23. The designation of a network of MCZs will clearly benefit marine and coastal habitats within the protected areas but there will also be positive effects for areas outside of the MCZ network that are less clear. For example, MPAs often protect nursery grounds, which will improve fish populations over a greater area. The extent to which positive externalities such as this occur will differ across species and ecosystems.

8.24. Overall, the main objective of creating a network of MCZs is biodiversity protection rather than increasing Maximum Sustainable Yield (MSY\textsuperscript{80}). Naturally, this intervention and the protection granted through management will have positive effects in ensuring MSY and protecting marine resources. However, the effects of MCZ designation on MSY (both ecological and economic) are not quantified here since advanced modelling would be required for the assessment of either positive or negative outcomes relative to MSY and this is beyond the scope of the current policy proposal.

9. Potential trade implications

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

10. MCZ post-implementation review plan

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

\textsuperscript{80} MSY: The largest average catch or yield that can continuously be taken from a stock under existing environmental conditions

ICES definition: https://www.ices.dk/community/Documents/Advice/Acronyms_and_termiology.pdf

\textsuperscript{81} Dechezleprêtre and Sato (2014)

\textsuperscript{82} The most recent report (December 2018) is available at: https://www.gov.uk/government/publications/marine-protected-areas-network-report-2012-to-2018
11. Conclusion

11.1. There are considerable benefits to designating the 3rd tranche of 41 new MCZs. A combined area of 7278 mi² will be protected and 200 features (habitats, species and geological features) will be conserved. This protection will result in an increase in benefits supplied by ecosystem services and their components, such as increases in provisioning (e.g. fish and shellfish provision), regulating (e.g. climate regulation), supporting (e.g. nutrient cycling) and cultural and recreational services. An ecologically coherent network of MPAs is likely to have additional benefits such as the conservation of marine and coastal biodiversity, an increase in biological resilience to adapt to changed conditions, the protection or enhancement of ecosystem services and will help the recovery of depleted stocks of exploited species. Illustrative studies suggest this could be worth as much as £262m from recreational benefits alone.

11.2. The total estimated undiscounted quantified economic costs of the 41 sites proposed for designation in 2019 ranges from £81.79m to £144.28m and the best estimate is £95.85m. This gives a present value of between -£106.31m and -£60.26m and a best estimate of -£70.62m over the 20-year timeframe of the IA, where private costs account for £9.95m and public costs £60.68m. The best estimate equivalent annual cost to business is £0.7m/yr (2016 prices, 2019 present value base year). The main costs to industry are for recreation (£0.287m/yr), oil and gas (£0.140m/yr), ports and harbours (£0.117m/yr) and commercial fisheries (£0.114m/yr).

<table>
<thead>
<tr>
<th>Impacted Private Sector</th>
<th>Best Estimate average annual Cost £m/yr (low - high)</th>
<th>Best estimate PV Costs £m (low –high)</th>
<th>Description of Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate Extraction</td>
<td>0.006m/yr (0.006-0.007)</td>
<td>0.074m (0.074 – 0.114)</td>
<td>Licence application costs to collect more information on impact on designated features. These costs are additional to the cost incurred for tranche 1 and tranche 2. Some costs associated with aggregates were presented in the tranche 1 IA and are due to the existence of an MCZ network and hence not specific to tranche 3, so have not been included here as they are part of the baseline costs.</td>
</tr>
<tr>
<td>Aquaculture</td>
<td>No extra costs quantified</td>
<td>No extra costs quantified</td>
<td>No significant costs to aquaculture are anticipated as a result of tranche 3.</td>
</tr>
<tr>
<td>Cables</td>
<td>0.002m/yr (0.001-0.003) 83</td>
<td>0.030m (0.015- )</td>
<td>Licence application costs for future developments to collect more</td>
</tr>
<tr>
<td>Sector</td>
<td>No extra costs quantified</td>
<td>No extra costs quantified</td>
<td>Additional costs unlikely.</td>
</tr>
<tr>
<td>--------------------------------</td>
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</tr>
<tr>
<td><strong>Coastal Development</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Commercial Fisheries</strong></td>
<td>0.114 m/yr (0.000-0.958)</td>
<td>1.681 m (0.000-14.087)</td>
<td>Site and gear specific restrictions on fishing activities, for example restricting trawling in specific sections of an MCZ where a particular feature is present. Costs are the best estimate of the range of management scenarios, with an assumption of 75% displacement. These are calculated as loss in Gross Value Added (GVA), as for all sectors. High scenario includes sensitivity of loss of all affected fishing GVA.</td>
</tr>
<tr>
<td><strong>Heritage Assets</strong></td>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Oil &amp; Gas</strong></td>
<td>0.140 m/yr (0.105-0.166)</td>
<td>2.105 m (1.565-2.518)</td>
<td>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 &amp; 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.</td>
</tr>
<tr>
<td><strong>Ports, Harbours, Commercial Shipping and Disposal Sites</strong></td>
<td>0.117 m/yr (0.114–0.396)</td>
<td>1.746 m (1.702–5.843m)</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Recreation</strong></td>
<td>0.287 m/yr (0.026-1.270)</td>
<td>4.236 m (0.410 – 18.681)</td>
<td>Management of anchoring and mooring at Bembridge and Studland bay may be needed to protect the features with a GMA of recover.</td>
</tr>
</tbody>
</table>
Management of chartered vessels’ access to black bream nesting sites may be needed at Southbourne Rough, Poole Rocks and Purbeck Coast.

<table>
<thead>
<tr>
<th>Renewable Energy</th>
<th>0.005m/yr</th>
<th>0.074m</th>
<th>Licence application costs for future developments to collect more information specifically of impact on BSH.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total annual and PV costs to private sector</strong></td>
<td>0.671m/yr (0.257 – 2.804)</td>
<td>9.946m (3.840 – 41.364)</td>
<td>PV 2019 base year; 2016 prices</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impacted Public Sector</th>
<th>Cost £m/yr (low-high)</th>
<th>PV cost £m (low-high)</th>
<th>Description of Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment Agency (for FCERM)</td>
<td>No extra costs quantified</td>
<td>No extra costs quantified</td>
<td>Potential licence application costs to Environment Agency for any future developments – additional costs to consider impact on broad scale habitats; plus potential one-off cost for additional monitoring where required.</td>
</tr>
<tr>
<td>National Defence</td>
<td>0.003m/yr</td>
<td>0.050m</td>
<td>Costs of adjusting electronic tools and charts and annual costs of maintaining. Additional planning considerations.</td>
</tr>
<tr>
<td>Management &amp; enforcement of MCZs</td>
<td>1.658m/yr (1.370 – 1.947)</td>
<td>24.454m (20.189 – 28.719)</td>
<td>Costs to MMO, IFCAs and Defra for enforcing management measures.</td>
</tr>
<tr>
<td>Ecological Surveys</td>
<td>2.460m/yr</td>
<td>36.177m</td>
<td>Costs of baseline surveys and costs of monitoring to JNCC and Natural England.</td>
</tr>
<tr>
<td><strong>Annual and PV costs to public sector</strong></td>
<td>4.121/yr (3.833 – 4.410)</td>
<td>60.681m (56.416 – 64.946)</td>
<td></td>
</tr>
<tr>
<td><strong>Overall annual and PV costs</strong></td>
<td>4.792m/yr (4.090 – 7.214)</td>
<td>70.627m (60.256 – 106.310)</td>
<td>Annualised total costs for public and private sector</td>
</tr>
</tbody>
</table>

**Notes:**
- The annual costs (m/yr) for each sector (including public costs) are total costs (transition plus annual) averaged over the 20-year period (2019 to 2038), presented in 2016 prices. The EANDCB figure of £0.7m/yr is calculated by converting the figures to 2016 prices and 2019 present value year.
11.3. The main (best estimate) costs to government under the preferred option are £1.658m/yr for management and enforcement of the sites, £2.460m/yr for ecological survey work and a small cost to national defence (£0.003m/yr).

11.4. In addition there are some costs that have not been quantified. Costs associated with sectors where future projects were highly uncertain but costs are expected to be low have not been quantified (e.g. archaeology and aquaculture). It has also not been possible to quantify impacts on local communities from the restriction and/or management of fisheries, i.e. in addition to the direct costs to the fishing industry. Some public sector costs, such as costs to inform users about MCZs or advice to public authorities on impacts of proposed licensed activities on MCZs, and other costs to the public authorities following the advice, have not been monetised. These costs have been described qualitatively.

11.5. The costs analysis in the IA has benefitted from engagement with stakeholders as described in Section 7.2 above. This has resulted in costs being assessed on a very detailed basis, with assumptions often varying by site. Details of calculations by sector are given in Annex D.
References


Fletcher, S., Saunders, J., Herbert, R., Roberts, C., & Dawson, K. 2012 (a). Description of the Ecosystem Services Provided by Broad-scale Habitats and Features of Conservation
Importance that are Likely to be Protected by Marine Protected Areas in the Marine Conservation Zone Project Area. Research report produced for Natural England. NECR088


Rees, S.E., Ashley, M., Evans, L., Mangi, S., Rodwell, L., Attrill, M., Langmead, O., Sheehan, E., Rees, A. 2016. An evaluation framework to determine the impact of the Lyme Bay Fisheries and Conservation Reserve and the activities of the Lyme Bay Consultative Committee on ecosystem services and human wellbeing. A report to the Blue Marine Foundation by research staff the Marine Institute at Plymouth University, Exeter University and Cefas.


Annex A: Management Scenarios

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

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Management Scenarios</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albert Field</td>
<td>Scenario 1: No additional management&lt;br&gt;Scenario 2: Closure of entire MCZ to bottom trawls and dredges</td>
<td>Subtidal coarse sediment has a recover GMA and is sensitive to mobile bottom-abrading gear.</td>
</tr>
<tr>
<td>Axe Estuary</td>
<td>Scenario 1: No additional management</td>
<td>No additional management is expected.</td>
</tr>
<tr>
<td>Beachy Head East</td>
<td>Scenario 1: No additional management&lt;br&gt;Scenario 2: Zoned closure of the eastern side of site to bottom trawls and dredges&lt;br&gt;Scenario 3: Zoned closure of specific areas (Ross worm reef) to bottom trawls and dredges&lt;br&gt;Scenario 4: Closure of entire MCZ to bottom trawls and dredges</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gear.</td>
</tr>
<tr>
<td>Bembridge</td>
<td>Fisheries:&lt;br&gt;Scenario 1: No additional management&lt;br&gt;Scenario 2: Zoned closure to bottom trawls, dredges, pots and traps to a 2m depth contour against the shoreline&lt;br&gt;Scenario 3: Zoned closure</td>
<td>Recreation:&lt;br&gt;Scenario 1: No additional management&lt;br&gt;Scenario 2:&lt;br&gt;• Zoned closure (voluntary or legislated) to anchoring over seagrass in along western (landward) edge of Priory Bay MCZ</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Scenario</th>
<th>Management Details</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Berwick to St Mary's | Scenario 1: No additional management  
Scenario 2: Code of conduct including zonal speed restrictions at certain times of the year  
Scenario 3: Code of conduct including zonal speed restrictions at certain times of the year (with restrictions in place for a longer period and a greater area of the site compared to Scenario 2) | Common eider has a recover GMA. Management is likely through a voluntary code of conduct. |
| Camel Estuary | Scenario 1: No additional management | No additional management is expected. |
| Cape Bank | Scenario 1: No additional management  
Scenario 2: Closure of entire MCZ to bottom trawls and dredges | Moderate energy circalittoral rock and subtidal coarse sediment have a recover GMA and are sensitive to mobile bottom-abrading gear. |
| Dart Estuary | Scenario 1: No additional management | Several features to be designated have a recover GMA. No significant management is expected although there may be a need for aquaculture businesses to increase monitoring and management of feral Pacific oysters. |
| Devon Avon Estuary | Scenario 1: No additional management | No additional management is expected. |
| Dover to Deal | Scenario 1: No additional management  
Scenario 2: Closure of entire MCZ to bottom trawls and dredges | Some additional features have a recover GMA and are sensitive to mobile bottom-abrading gear. |
| East of Start Point | Scenario 1: No additional management | Subtidal sand has a recover GMA and is anchoring and mooring. The majority of anchoring and mooring activity does not overlap sensitive features and will not be affected. |

of specific areas (seagrass, sea-pen and burrowing megafauna communities and native oyster) to bottom trawls, dredges, pots and traps  
Scenario 4: Closure of entire MCZ to bottom trawls and dredges, pots, nets, lines and traps  
- Re-siting (within the same location) of a small number of moorings  
- Zoned closure to anchoring over maerl beds on Culver Spit
<table>
<thead>
<tr>
<th>Location</th>
<th>Scenario 1: No additional management</th>
<th>Scenario 2: Zoned closure of the western half of the MCZ to bottom trawls and dredges to protect areas of high energy and moderate energy circalittoral rock</th>
<th>Scenario 3: Closure of entire MCZ to bottom trawls and dredges and 50% reduction in activity of lines, nets, pots and traps to protect areas of high energy infralittoral rock and high/moderate energy circalittoral rock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erme Estuary</td>
<td>Scenario 1: No additional management</td>
<td>No additional management is expected.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gear.</td>
</tr>
<tr>
<td>Foreland</td>
<td>Scenario 1: No additional management</td>
<td>Moderate energy circalittoral rock, ross worm reefs and blue mussel beds have a recover GMA and are sensitive to mobile bottom-abrading gear.</td>
<td>Native oyster has a recover GMA. It is unlikely that additional management measures will be required.</td>
</tr>
<tr>
<td>Goodwin Sands</td>
<td>Scenario 1: No additional management</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gear.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Helford Estuary</td>
<td>Scenario 1: No additional management</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Subtidal coarse sediment and subtidal mixed sediment have recover GMAs and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Holderness Offshore</td>
<td>Scenario 1: No additional management</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Subtidal coarse sediment and subtidal mixed sediment have recover GMAs and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Inner Bank</td>
<td>Scenario 1: No additional management</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Subtidal coarse sediment and subtidal mixed sediment have recover GMAs and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Kentish Knock East</td>
<td>Scenario 1: No additional management</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>All features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Markham's Triangle</td>
<td>Scenario 1: No additional management</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>All features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Morte Platform</td>
<td>Scenario 1: No additional management</td>
<td>All features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>All features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Location</td>
<td>Scenario 1: No additional management</td>
<td>Scenario 2: Closure of entire MCZ to bottom trawls and dredges</td>
<td>Scenario 3: Closure of entire MCZ to bottom trawls and dredges</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>North East of Haig Fras</td>
<td>All features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North West Lundy</td>
<td>Subtidal coarse sediment has a recover GMA and is sensitive to mobile bottom-abrading gears.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orford Inshore</td>
<td>Subtidal mixed sediment has a recover GMA and is sensitive to mobile bottom-abrading gears.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Otter Estuary</td>
<td>No additional management is expected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poole Rocks</td>
<td>Black bream has a recover GMA and is sensitive to fishing activities such as trawling, netting, hooks and lines and recreational angling.</td>
<td></td>
<td>Black bream has a recover GMA and is sensitive to fishing activities such as trawling, netting, hooks and lines and recreational angling.</td>
</tr>
<tr>
<td>Purbeck Coast</td>
<td>The maerl beds feature has a recover GMA and is sensitive to mobile bottom-abrading gears.</td>
<td></td>
<td>Black bream has a recover GMA and is sensitive to fishing activities such as trawling, netting, hooks and lines (including angling from an anchored boat). Potting could also impact on black bream but only if pots are placed directly on a nesting site.</td>
</tr>
</tbody>
</table>

Specifically for black bream:

Scenario 1: No additional management

Scenario 2: During spawning and breeding season (April to July) in areas of known nesting sites restrict trawling, potting, netting, hooks and lines and recreational angling.

Scenario 3: During spawning and breeding season (April to July), closure of entire MCZ to trawling, netting, hooks and lines and recreational angling.
<table>
<thead>
<tr>
<th>Location</th>
<th>Scenario 1: No additional management</th>
<th>Scenario 2: Closure of entire MCZ to bottom trawls and dredges</th>
<th>Scenario 3: During spawning and breeding season (April to July), closure of entire MCZ to trawling, netting, hooks and lines and recreational angling.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queenie corner</td>
<td></td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>pots are placed directly on a nesting site.</td>
</tr>
<tr>
<td>Ribble Estuary</td>
<td>No additional management</td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>No additional management is expected.</td>
</tr>
<tr>
<td>Selsey Bill and the Hounds</td>
<td>No additional management</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Solway Firth</td>
<td>No additional management</td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>No additional management is expected.</td>
</tr>
<tr>
<td>South of Celtic Deep</td>
<td>No additional management</td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>South of Isles of Scilly</td>
<td>No additional management</td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>South of Portland</td>
<td>No additional management</td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>South Rigg</td>
<td>No additional management</td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading and static gears.</td>
</tr>
<tr>
<td>South West Approaches to Bristol Channel</td>
<td>No additional management</td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>South West Deeps (East)</td>
<td>No additional management</td>
<td>Subtidal mud and sea pens &amp; burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
<td>Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Location</td>
<td>Scenario 1: No additional management</td>
<td>Scenario 2: During spawning and breeding season (April to July) in areas of known nesting sites restrict trawling, potting, netting, hooks and lines and recreational angling</td>
<td>Scenario 3: During spawning and breeding season (April to July), closure of entire MCZ to trawling, netting, hooks and lines and recreational angling.</td>
</tr>
<tr>
<td>------------------------</td>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Southbourne Rough</td>
<td>Scenarios: No additional management</td>
<td>Black bream has a recoverable GMA and is sensitive to fishing activities such as trawling, netting, hooks and lines (including angling from an anchored boat). Potting could also impact on black bream but only if pots are placed directly on a nesting site.</td>
<td></td>
</tr>
<tr>
<td>Fishery:</td>
<td>Scenario 1: No additional management</td>
<td>There are both fisheries and recreational management scenarios for this site.</td>
<td>For fisheries, seagrass beds have a recoverable GMA and are sensitive to mobile bottom-abrading and static gears.</td>
</tr>
<tr>
<td>Recreation:</td>
<td>Scenario 1: Replacement of existing moorings with eco-moorings</td>
<td>For recreation, sea grass beds have a recoverable GMA and are sensitive to anchoring and mooring.</td>
<td>For recreation, sea grass beds have a recoverable GMA and are sensitive to anchoring and mooring.</td>
</tr>
<tr>
<td>Swanscombe (Lower Thames)</td>
<td>Scenario 1: No additional management</td>
<td>No additional management is expected.</td>
<td>Subtidal coarse sediment and subtidal</td>
</tr>
<tr>
<td>West of Copeland</td>
<td>Scenario 1: No additional management</td>
<td>No additional management is expected.</td>
<td>Subtidal coarse sediment and subtidal</td>
</tr>
<tr>
<td>Location</td>
<td>Scenario 1: No additional management</td>
<td>Scenario 2: Closure of entire MCZ to bottom trawls and dredges</td>
<td>Scenario 3: Zoned closure of areas to all gears against the shoreline</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------------------</td>
<td>---------------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>West of Wight Barfleur</td>
<td>Scenario 1: No additional management</td>
<td>Scenario 2: Closure of entire MCZ to bottom trawls and dredges</td>
<td>Subtidal coarse sediment and subtidal mixed sediments have a recover GMA and are sensitive to mobile bottom-abrading gears.</td>
</tr>
<tr>
<td>Wyre Lune</td>
<td>Scenario 1: No additional management</td>
<td></td>
<td>No additional management is expected.</td>
</tr>
<tr>
<td>Yarmouth to Cowes</td>
<td>Scenario 1: No additional management</td>
<td>Scenario 2: Zoned closure of areas to all gears</td>
<td></td>
</tr>
</tbody>
</table>
Annex B: Benefit Studies

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

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

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

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

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

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\(^{84}\) 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.

\(^{85}\) UK National Ecosystem Assessment Follow On: http://uknsoppr/zni1956 ea.unep-wcmc.org/LinkClick.aspx?fileticket=UEp3mJSVBw%3D&tabid=82


\(^{87}\) “Millennium ecosystem assessment.” Ecosystems and Human Well-Being: Biodiversity Synthesis, Published by World Resources Institute, Washington, DC (2005).


\(^{89}\) Kenter et al. (2013) http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUApvh%2BY%3D&tabid=82
<table>
<thead>
<tr>
<th>Ecosystem Service category and type of value</th>
<th>Study</th>
<th>Methodology</th>
<th>Key Findings</th>
<th>Impact Assessment applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public willingness to visit (WTV) different coastal settings to assess how biodiversity and psychological restoration are rated</td>
<td>M.P. White et al. (2017)</td>
<td>Online survey panel coordinated by PFA Research in Cornwall It was assumed that higher values of WTV are associated with higher preferences.</td>
<td>People surveyed assigned greater emotional and restorative value to coastal environments with higher levels of perceived biodiversity. Particularly, a one point increase in perceived biodiversity was associated with a .50 increase in WTV Marine wildlife is assumed to influence people’s willingness to visit as well; indeed, observing behaviours classed as ‘high fascinating’ was associated with a .24-point increase in WTV</td>
<td>While these figures cannot be taken into consideration for the valuation of the third tranche specifically, they can be used as an indicator of the significant positive relationship between higher perceived biodiversity/fascinating wildlife behaviour and willingness to visit.</td>
</tr>
</tbody>
</table>
| Public willingness to pay for alternative management regimes of remote MPAs in the North Sea (use and non-use values) | R. Brouwer et al. (2016) | A contingent valuation (CV) survey to estimate WTP of beach visitors and a random sample of coastal and non-coastal residents for two alternative management scenarios of three areas: Dogger Bank, Frisian Front and Cleaver Bank | Three different management options were presented:
1) Status quo scenario
2) Scenario in which the 3 areas under analysis become MPAs where economic activities are permitted under certain conditions
3) Scenario in which the 3 areas are designed as fully protected MPAs and all economic activities are not allowed

**MAIL SURVEY:** DB (double-bounded) mean WTP (per year) for the management option 2 is €87.5 while for the management option 3 is €109.9
OE (Open-ended) mean WTP (per year) for the management option 2 is €56.6 while the average WTP for the third management option is €67.7

**BEACH INTERVIEWS:**
DB mean WTP (per year) for the management option 2 is €110.8 while for the management option 3 is €168.8.
OE mean WTP (per year) for choosing the management alternative n.2 is €80.1 whilst people’s WTP for management alternative n.3 is €132.4 |

These sites are not included in the MCZ tranche 3 designations, and therefore the figures are not specifically applicable to tranche 3. However, this work does support the findings of a previous study carried out by Börger et al. (2014) that also includes the UK portion of the Dogger Bank and reports positive willingness to pay values for the conservation of an offshore site.
| Recreation – Tourism and Sailing: Willingness to pay for conservation of characteristic habitats and species (Use and non-use values) | M. Getzner, M. Jungmeier and M. Špika (2016) | Face to face survey presented to two different groups of visitors at Lastovo Islands (Croatia) covering the period July-August 2013. Group A: Families and individuals who went to the island by car, train, bus and further connecting via public ferry or fast boat. Group B: Sailors anchoring or mooring in selected sites of the island. | Willingness to pay for two biodiversity conservation scenarios: Scenario 1 - Effective implementation of a Management Plan which is aimed at protecting species and habitats in order to increase biodiversity. Scenario 2 – Establishment of a Marine Park and effective zoning. This scenario is associated with a greater increase in biodiversity. The mean WTP to pay of respondents from Group A for Scenario 1 is €3.41 whereas the WTP of Group B respondents, on the same scenario, is €2.03. § The mean WTP of respondents from Group A for Scenario 2 is €4.31 whereas the WTP of Group B visitors for the same scenario is €2.75. Overall, tourists and sailors are willing to pay an entry fee which could raise between EUR 330,000 to 451,000 per year for improvements of marine biodiversity and a greater level of protection. | While the study illustrates the benefit of adopting a conservation strategy to reduce loss of marine biodiversity, the figures cannot be used to inform the third tranche specifically due to the very different habitats, climates and cultures involved. |

| | | | | |
| Willingness to pay for healthy underwater vegetation, protection of pristine areas and size of fish stock in Finland, Sweden and Lithuania | A.K. Kosenius, O. Markku, (2015) | A choice experiment (CE) to assess how much people in each of the countries surveyed would pay for marine and coastal quality improvements | Three marine attributes under consideration: 1. Amount of healthy vegetation 2. Preservation of pristine areas 3. Size of the fish stock Estimated with conditional and random parameters logit models. Overall, the WTP estimates are highest for the Swedes and lowest for the Lithuanians. All the countries elicited a higher WTP for large improvements in vegetation Average WTP per person: Finland $100.8, Sweden: $231.4 and Lithuania $43.2. Protection of pristine areas - average WTP per person: Finland: $92.4, Sweden: $120.1 and Lithuania: £35.3. Increase of fish stocks – Finland: $83.8, Sweden: $181.1 and Lithuania: $ 36. |

<p>| Recreation – Tourism: willingness to pay to visit Lundy Island (UK) | D-R. Chae, P. Wattage and S. Pascoe (2012) | A combination of valuation methods (travel cost method and contingent valuation method) have been used in order to estimate the willingness to pay for travelling to Lundy Island under three alternative travel cost | Results: Willingness to pay of each visitor per trip for the recreational use of the island under TC1 scenario is £359.4 whilst under scenario TC2 is £397.4. Under the third scenario hypnotised, TC3, each tourist would be willing to pay £574.4 per trip. The estimates reported in the study appear to be high but, as pointed out by the author, this may be due to several factors like higher price of petrol in UK compared to other countries and the ferry. Even though this study estimates both the market and the non-market value of recreation and tourism on Lundy Island, these figures cannot be used for the third tranche IA specifically because this site has been already designated during tranche two. |
| Recreation – Tourism; Education and Research: willingness to pay for access to coastal Marine Protected Areas | L. Paltriguera, S. Ferrini, T. Luisetti and R.K. Turner (2018) | Choice Experiment method to estimate preferences for recreational investments in MPAs. | Location of the study: Flamborough Head, England. The researchers estimated WTP per visit under a variety of scenarios, including an improved visitors centre (£9.18), educational boards (£7.27) a website (£4.64). | The study is not specific to the third tranche of MCZs. Nevertheless, the study is still relevant because it shows aggregate benefits from management measures, as well as further infrastructure spending. |
| Recreation-Tourism: willingness to pay for grey seals conservation and their recreational value (use and non-use) | V. Bosetti and D. Pearce (2003) | A contingent valuation (CV) to estimate the conservation and recreational value of seals | Location of the study: South West England (Seal Sanctuary – Gweek, Harbours of St. Ives and Dartmouth – seal watching) The researchers aggregated the average WTP expressed in the form of a conservation fee paid in addition to the entrance fee (£5.26) over the annual Seal Sanctuary visitors (166,240) and obtained a yearly gross WTP of £874K (non-use value) | Even though grey seals are not included in tranche 3, this study is still relevant because it shows the aggregate benefits arising from conservation management policies. |</p>
<table>
<thead>
<tr>
<th>Fish and shellfish for human consumption: population densities, age and size of scallops over time.</th>
<th>Beukers-Stewart et al. (2005)</th>
<th>Diver and dredge surveys of closed area protection on <em>pecten maximus</em> populations between 1989-2003.</th>
<th>Increasing and accelerating population density of scallops within the closed area, from 0.5/100m² in 1989 to 20/100m² in 2001, and adjacent to the closed area, from 0.5m/100m² in 1996 to 5/100m² in 2000. Both densities experienced declines in years following 2001. Age and size compositions of the scallop population in the closed and fished areas also improved between the years 2001-2003.</th>
<th>The study takes place in the Isle of Man, and is not specific to the 3rd tranche of MCZs. It does not attempt to quantify the benefits of improved human consumption of shellfish. The study is nonetheless relevant in demonstrating the benefits of closed area protection for shellfish producers and consumers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish and shellfish for human consumption; natural hazard protection; regulation of pollution; recreation-tourism: evaluation framework of ecosystem processes &amp; services.</td>
<td>Rees et al. (2016)</td>
<td>Weight and value of static and mobile landings between 2005/06-2013/14. Questionnaires of Lyme Bay fishers subjective well-being (job satisfaction, income satisfaction, health) between 2005-2015.</td>
<td>Location of study: Lyme Bay Reserve. Mean static weight and value increased during the period of study. Mean mobile weight and value decreased, but there were no observation beyond 2007/08. Job satisfaction rose by an average of two ranking scores between the years 2008-2015. Income satisfaction remains stable over the period of observation. Stress remained static across the period of observation.</td>
<td>The study takes place in an area specific to tranche 2, and does not attempt to quantify the benefits. The study is nonetheless relevant in demonstrating the wellbeing and ecosystem benefits of closed area protection for fishers.</td>
</tr>
<tr>
<td>Provision of ecosystem services under baseline status quo scenario and a scenario of additional MPA designation.</td>
<td>Barnard et al. (2014)</td>
<td>A review of UK economic valuation literature (Beaumont et al., 2006; Moran et al., 2008; Gonzalez-Alvarez et al., 2012), scaled-down to NI proportions of wider MPA network.</td>
<td>Net present values of £52.8-£54.5 million over a 20-year period (3.5% discount rate) may be realised depending on the management regime adopted. The economic valuation focussed on on-site benefits only, and therefore off-site benefits such as the potential for spill-over effects to local commercial fisheries are not included within these estimations.</td>
<td>Whilst the results are not specific to the proposed tranche of MCZs, the results from this project have been included where appropriate as an example of quantifying benefits in NI waters.</td>
</tr>
</tbody>
</table>

### Relevant literature considered in Impact Assessments for previous MCZ tranches:

| Willingness to pay (WTP) to protect features of an offshore marine protected area | Börger et al. (2014) | **Choice experiment** 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. Assuming that there were 26.6 million households in UK in 2013 when the survey was conducted (ONS, 2016), this gives a yearly gross WTP of £111m and £202m respectively for the increase in species diversity in the UK portion of the Dogger Bank. | The Dogger Bank is not part of the MCZ Tranche 3 designation but is an SAC, hence the values cannot be directly transferred to MCZs. However, the study demonstrates that the UK population holds positive benefit values for the conservation of offshore sites and their variety of species, which are relevant to several sites proposed for protection. |
Likewise, for the protection of charismatic species in the UK part of the Dogger Bank, the yearly gross WTP is £638m and £798m respectively.

| Willingness to pay to protect deep sea habitats | Jobstvogt et al. (2014) | **Choice experiment** 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. Assuming that there were 2.3m households in Scotland in 2010 this gives a yearly gross WTP between £51m and £60m for intermediate level of species protection. The yearly gross WTP in Scotland for a higher level of species protection is estimated to be between £80M and £89M. | The study considered a hypothetical increase in the number of Scottish MPAs to include deep sea habitats and therefore cannot be directly applied to the third tranche areas. However, it provides evidence on positive benefit people assigned to existence values, option values and values of unfamiliar and remote goods and services in general. |
| Non-use value of protection for English specific MCZs | Kenter et al. (2013) | **Contingent valuation** applied to estimate the non-use value of 22 Scottish potential Marine Protected Areas (pMPAs/MPA areas of search), 120 English | The report concludes that, if expressed in economic terms, the benefits to divers and sea anglers of designating marine protected areas outweigh the cost of designation (consisting of monetised costs to government and industry). The study estimates benefits from designation of MPAs in England, Wales and Scotland. The counterfactual, one off non-use value of protecting the sites to divers and | 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 use value relating to protection) | recommended Marine Conservation Zones (MCZs) and 7 existing Welsh marine Special Areas of Conservation (SACs). The study includes consideration of how these values may alter under different management regimes. A travel-cost based choice experiment was also conducted to estimate annual recreational values. anglers alone would be worth £730-£1,310m (excluding divers and anglers willingness to pay for specific restrictions on other users). The research also estimated the recreational value of MPAs to be £1.87 – 3.39 billion for England alone. McVittie, A. and D. Moran (2010). Choice experiment used to estimate the WTP for a hypothetical UK network of MCZs to ‘halt the loss of marine biodiversity’. English respondents WTP £69.49/yr/hh to halt loss of biodiversity, and £3.98/yr/hh to impose moderate restriction on resource extraction. Assuming there were 22 million households in England in 2008 (ONS, 2016) this equates to £1.5bn and £87m respectively. Study only presents the benefits of a hypothetical UK network. Benefits for the smaller number and area of proposed English MCZs not possible to robustly disaggregate. |
References:


Rees, S.E., Ashley, M., Evans, L., Mangi, S., Rodwell, L., Attrill, M., Langmead, O., Sheehan, E., Rees, A. 2016. An evaluation framework to determine the impact of the Lyme Bay Fisheries and Conservation Reserve and the activities of the Lyme Bay Consultative Committee on ecosystem services and human wellbeing. A report to the Blue Marine Foundation by research staff the Marine Institute at Plymouth University, Exeter University and Cefas.
Annex C: Benefit estimation taken from published report - The value of potential Marine Protected Areas in the UK to divers and sea anglers

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

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

Methodology

Information was gathered using an online questionnaire. The questionnaire included a monetary valuation section, a mapping section to establish visit numbers to potential MPA sites, and a non-monetary valuation section consisting of subjective wellbeing questions\(^93\).
A total of 1683 usable responses were received from 1261 divers (75%) and 422 anglers (25%).

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

### Table 1 MPA survey outline
1. General background questions (educational background, etc.) and questions on how the participant engages with the environment (how often they go diving/angling, etc.).

2. Short descriptive section on the MPA proposals.

3. A combination of a travel cost, frequency based choice experiment and contingent valuation, where participants are asked to allocate trips to hypothetical sites, and their willingness to pay for protection against a risk of future harm.

4. Follow-up questions on choice-making strategies and decision-making rules.

5. An interactive mapping session to establish how often participants visit 15 potential MPA sites randomly selected from the region where they dive or angle most.

6. A non-monetary valuation component consisting of a series of Likert scale questions on the subjective wellbeing participants derived from the sites that they indicated they visited.

7. A set of psychometric questions based on the Values-Beliefs-Norms (VBN) theory and the Theory of Planned Behaviour (TPB).

8. An opportunity to leave their name and email or postal address if participant expressed an interest in participating in one of the phase 2 deliberative workshops.

The monetary valuation component of the survey consisted of a two-stage approach. In the first stage, a choice experiment (CE) was used. CEs are a stated preference technique where respondents are presented with a series of choices between more or less desirable alternatives (Hanley, Wright & Adamowicz 1998). These choices are described by of a number of attributes. Each attribute is available at different levels. Here participants were asked to compare hypothetical diving or angling sites each with a range of environmental and recreational attributes, including travel distance, which was used as a cost-proxy. This provides a lower bound for participants’ use values for the sites presented, with other costs (accommodation etc.) assumed constant. Further attributes were: marine landscape, underwater objects present, fish and other sea life present, restricted activities, access, number of vulnerable species found at the site that would be protected and size of the
protected area (Section 2.2.2 and Table 7 of the report\textsuperscript{94}). In the CE, participants were asked to allocate the next five opportunities for diving/angling they have within the next year between these three options: two sites, A and B, and ‘staying at home’.

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

The authors state their CVM design can be thought of as eliciting an insurance value. Donations requested from respondents can be thought of as a premium to pay for the avoidance of harm to environmental goods of value. They considered motivation for paying this premium to be associated with three sources of non-use value: option value (the value of retaining the possibility of using a site in the future, including the value of avoiding irreversibility of harm (c.f. Arrow & Fisher 1974; Farber, Costanza & Wilson 2002)); bequest value (the value of securing the site for future generations) and existence value (the value of knowing that the site and its sea life is secured regardless of any other benefits). The 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 prompt participants to only consider one or the other activity when indicating numbers of trips.

Assessing diver and angler recreational values for the proposed MCZs

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

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

\textsuperscript{95} Tranche 3 included, following advice provided by SNCBs, and has also considered a number of new sites to be suitable for designation as well as sites protecting highly mobile species. Nevertheless, those sites have not been included in the calculation of benefits in order
There are clearly many benefits to designating marine protected areas, just as there are costs. These benefits are challenging to estimate and Defra recognises the complexities of the scientific evidence as well as the effort that has been made by the report to value these estimates. Caution is needed in interpreting the figures and the report highlights that there are a range of limitations related to either sampling issues or framing of the monetary valuation.

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

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

The report looks at restriction scenarios where the sites are completely closed to specific activities. 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. The report also highlights limitations for using voluntary donations to estimate the one off non-use benefits.

The CVM do not depend on the visitor numbers. Table 16 in the report provides CVM estimates for each site corresponding to 4 restriction scenarios – e.g. ‘no restriction’, ‘no Dredging and Trawling’, ‘no dredging, trawling, potting and gillnetting’ and ‘no dredging, trawling, anchoring and mooring’. Therefore, the values in Table 16 of the report were to be consistent with the work carried out by Kenter et al. which is based only on the Regional Project sites proposed for Designation in 2011.

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.

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.


no potting and gillnetting; no anchoring or mooring; no dredging and trawling

Restricted 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.

In terms of CVM framing the report used voluntary donations as a payment vehicle to estimate the willingness to pay to protect features from an uncertain future risk and an insurance against future harm and degradation. Although commonly used, there are risks that respondents ignore their budget constraints when responding to the survey. In addition, there might be free rider concerns as well.

The report states that a separate potential framing bias in the CVM is that the preamble mentions BSAC, AT and MCS as research partners, and that the results of the study may be used in their consultation submissions. This might have increased willingness to donate if participants felt sympathetic to these organisations.
matched to the management scenarios considered in the third tranche IA to come up with site and tranche specific estimate ranges. Depending on the management scenario in each of the 30 proposed regional project sites and whether values were available in the original report, these estimates were matched according and aggregated to get a total one off non-use value (£180m to £345m\textsuperscript{102}).

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

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

\textsuperscript{102} Estimates updated to 2016 prices.
Annex D: Costs to private and public sectors (profile of costs over 20 years) and key assumptions

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

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

### Business Costs:

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|-------------------|
| Licence application costs (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.116 | 0.006 |
| Total (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.116 | 0.006 |
| Present value costs (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.056 | 0.018 | 0.000 | 0.000 | 0.074 | 0.004 |

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

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

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

### Cables: Best Estimate

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------------------|
| License costs for all regions within 12nm (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.044 | 0.002 |
| Total (£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 | 0.000 | 0.000 | 0.011 | 0.044 | 0.002 |
| Present value costs (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.030 | 0.001 |
For the tranche 1 IA, the UK cable protection committee (UKCPC) estimated the additional cost to an operator of assessing the impacts of a future cable installation on broad-scale habitats protected by a MCZ to be £0.011m, for each future cable installation. This unit cost was uprated by inflation using the GDP deflator from 2011 to 2016 for the Tranche 3 IA; this gives the additional cost of £0.011m per licence. Costs are assumed to occur for cables that cross an MCZ within 12nm of the shoreline, but not those that are wholly beyond 12nm as they do not require a licence or EIA, unless they concern activities such as rock protection or unexploded ordnance, for which a marine licence would be required even in the absence of the 3rd tranche of MCZs. As it is not known where or when new telecoms and interconnector cables will occur, regional rather than site specific estimates are provided and potential licence applications was agreed with the UKCPC. The best estimate assumes that 4 cables license applications will incur an additional cost at the end of every 5 year period across all regions over the 20 year IA period. This calculates the costs from the 127 regional MCZ project sites proposed in 2011 (99 inshore sites). Hence this is then scaled down by 25.3% to estimate the cost for the 25 recommended inshore regional MCZ project sites in the 3rd tranche (25/99 = 25.3%), resulting in a cost of £0.011 every 5 years x 4 cables x 25.3% = 0.011 every 5 years (total £0.044). As the estimates of licence numbers by region were developed based only on the regional MCZ project sites, the new option sites are not included in this cost calculation. Nevertheless the additional cost from these sites are expected to be minimal, hence it was seen as disproportionate to repeat the original analysis to include the new option sites.

### Cables: Low Costs Estimates

<table>
<thead>
<tr>
<th>Year</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
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<th>2032</th>
<th>2033</th>
<th>2034</th>
<th>2035</th>
<th>2036</th>
<th>2037</th>
<th>2038</th>
<th>Total (£m)</th>
<th>Annual Average (£m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>License costs for all regions within 12nm (£m)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.005</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.005</td>
<td>0.022</td>
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</tr>
<tr>
<td>Total (£m)</td>
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<td>0.000</td>
<td>0.000</td>
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<td>0.000</td>
<td>0.005</td>
<td>0.022</td>
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<tr>
<td>Present value costs (£m)</td>
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<td>0.003</td>
<td>0.015</td>
<td>0.001</td>
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</tbody>
</table>

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

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

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

### Commercial fisheries (UK): Best Estimate

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------------------|
| Gross Value Added lost | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 2.285 | 0.114 |
| Total (£m) | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 0.114 | 2.285 | 0.114 |
| Present value costs (£m) | 0.114 | 0.110 | 0.107 | 0.103 | 0.100 | 0.096 | 0.093 | 0.090 | 0.087 | 0.084 | 0.081 | 0.078 | 0.076 | 0.073 | 0.071 | 0.068 | 0.066 | 0.064 | 0.062 | 0.059 | 1.681 | 0.084 |
Assumptions: Costs arise when management of some fishing activities change due to the designation of an MCZ relative to baseline management. Gear types affected and management required are specific to the site and the feature which the MCZ is designated to protect. For example, if a feature is sensitive to static gears, such as pots and trapping, then the management scenario is likely require restriction to the particular gear implying landings from the gear will be affected. The scenarios of management are site specific (provided in Annex A) and are based on the sensitivity of features to different gear types and when a site has a ‘maintain’ or ‘recover’ General Management Approach (GMA) as discussed in the main body of the IA. Actual management chosen is a regulator decision (MMO and IFCAs) and this IA contains a range of illustrative examples for each site. Although costs are calculated on the basis of year of designation (2019), in reality regulators could take up to 2 years to impose management measures as any bye-law must go through due process and may have its own impact assessment. However, as it is not known in which year measures will be in place for a particular site, costs are conservatively calculated from a 2019 basis, which may lead to a potential overestimate.

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

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

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

Summary for best scenario:
Cost for gear type = baseline landings value \times best estimate management scenario assumption \times displacement assumption where only 25% of landings will be lost \times GVA as proportion of landings.
### Commercial fisheries (UK): Low Estimate

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

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

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### Commercial fisheries (UK): High Estimate

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

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

Summary for best scenario:
Cost for gear type = baseline landings value x high estimate management scenario assumption x GVA as proportion of landings (more information on costs calculation is provided in this Appendix D spreadsheet)
## Oil and Gas and CCS: Best Estimate

| Year     | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | 2025  | 2026  | 2027  | 2028  | 2029  | 2030  | 2031  | 2032  | 2033  | 2034  | 2035  | 2036  | 2037  | 2038  | Total (£m) | Annual Average (£m) |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|---------------------|
|          |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |           |                       |
| Additional costs to future applications in Licensed 26th | 0.213 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.983 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.196 | 0.060 |
| Additional cost to decommissioning licences (£m) | 0.000 | 0.000 | 0.000 | 0.12  | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.000 | 0.000 | 0.000 | 0.000 | 0.047 | 0.002 |
| Additional costs to future CCS apps. (£m) | 0.000 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.000 | 0.000 | 0.205 | 0.010 |
| Additional costs to future applications in Licensed 27th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.319 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.319 | 0.016 |
| Additional costs to future applications in Licensed 28th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.043 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.043 | 0.002 |
| Additional costs to future applications in Licensed 29th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.099 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.099 | 0.005 |
| Additional costs to future applications in Licensed 30th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.883 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.883 | 0.044 |
| Additional costs to future applications in Licensed 31st | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.792 | 0.140 |
| Total Costs (£m) | 0.213 | 0.000 | 0.000 | 0.051 | 0.012 | 0.000 | 0.000 | 0.051 | 0.000 | 2.339 | 0.000 | 0.051 | 0.000 | 0.000 | 0.000 | 0.012 | 0.051 | 0.000 | 0.000 | 0.000 | 0.012 | 2.792 | 0.140 |
| Present value costs (£m) | 0.213 | 0.000 | 0.000 | 0.046 | 0.010 | 0.000 | 0.000 | 0.040 | 0.000 | 1.716 | 0.000 | 0.035 | 0.000 | 0.000 | 0.000 | 0.007 | 0.031 | 0.000 | 0.000 | 0.000 | 0.006 | 2.105 | 0.105 |
Assumptions: All costs to this sector are based on additional costs from appropriate assessments of environmental impacts of future oil and gas and CCS developments. There are 8 phases during application process (1. survey, 2. drilling exploration, 3. actual drilling, 4. development, 5. operation, 6. maintenance, 7. decommission and 8. post closure monitoring). All unit costs were uprated using the GDP deflator from 2011 (base price year for the Tranche 1 IA) to 2016 (base price year for the Tranche 3 IA) following consultation with DECC (Pers. Comm. 2016); For phase 1, 6 and 7 the costs are £0.002m each; for phases 2, 3 and 4 this increases to £0.004m each; for phase 5 this is £0.021m. Phase 8 costs are not expected to take place within the 20yr IA period and so are not included in calculations. Costs were calculated based on phases of the application process.

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

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

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

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

For the 26th round it is assumed that 50% of applications for round blocks not awarded in the 26th round with discovery will complete phases 2 and 3 (£0.004m x 2 = £0.008m per application) and the remaining 50% will complete phases 2, 3, 4 and 5 (£0.004m x 3 + £0.021m = £0.034m per application). The estimated number of oil and gas applications in licenced 26th round blocks with discovery that are not awarded is 54 in 2028. Therefore the relevant cost calculation is
 (£0.008m x 54 x 50%) + (£0.011m x 54 x 50%) = £1.139m in 2028. For blocks not awarded in the 26th round without discovery it is assumed all will complete phases 1, 2 and 3 (£0.002m + £0.004m x 2 = £0.011m per application). The estimated number of oil and gas applications in licenced 26th round blocks without discovery that are awarded is 257 in 2028. Therefore the relevant cost calculation is £0.011m x 257 = £2.711m in 2028. As above this is scaled down to 2/8 = 25% to capture the cost for the 3rd tranche only. This results in costs of £1.139m + £2.711m = £3.851m x 25% = £0.983m in 2028, after uprating to 2016 prices.

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

In the 27th, 28th, 29th, 30th and 31st 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 x 2 = £0.010m per application. There are 123 27th round blocks on offer which give additional acreage compared to acreage in the 26th round, this results in a cost of £0.010m x 123 = £1.298m in 2028. This is scaled down to 13/54 = 24.1% to account only for the 3rd tranche, as 13 of the 54 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 27th round are proposed for designation as part of 3rd tranche. The results in costs of £1.298m x 24.1% = £0.319m in 2028, after uprating to 2016 prices. There are 34 28th round blocks on offer which give additional acreage compared to acreage in the 26th round. However, the sites proposed for designation in the 3rd tranche are not the nearest environmental sensitive area to blocks on offer in the 28th round and so there are no attributable costs to the third tranche. There are 20 29th round blocks on offer which give additional acreage compared to acreage in the 26th round, this results in a cost of £0.010m x 20 = £0.211m in 2028. This is scaled down to 1/5 = 20% to account only for the 3rd tranche, as 1 of the 5 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 29th round are proposed for designation as part of third tranche. The results in costs of £0.211m x 20% = £0.043m in 2028, after adjusting to 2016 prices.

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

There are 139 31st round blocks on offer which give additional acreage compared to acreage in the 26th round, this results in a cost of £1.466m in 2028. This is scaled down to 59/100 = 59% to account only for the 3rd tranche, as almost 6 in 10 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 31st round are proposed for designation as part of third tranche. The results in costs of £1.466m x 59% = £0.883m in 2028, after adjusting to 2016 prices.
This analysis only takes into account the sites proposed as part of the regional MCZ projects, consequently the new options developed specifically for the 3rd tranche have not been included in the cost calculation. However the additional cost due to these sites are expected to be minimal, hence it was considered to be disproportionate to repeat the analysis to include these sites.

### Oil and Gas and CCS: High Estimate

| Year       | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|---------------------|
| Additional costs to future applications in Licensed 26th | 0.319 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.401 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.720 | 0.086 |
| Additional cost to decommissioning licences (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.000 | 0.000 | 0.000 | 0.012 | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.047 | 0.002 |
| Additional costs to future CCS apps. (£m) | 0.000 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.010 |
| Additional costs to future applications in Licensed 27th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.319 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.319 | 0.016 |
| Additional costs to future applications in Licensed 28th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Additional costs to future applications in Licensed 29th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.043 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.043 | 0.002 |
| Additional costs to future applications in Licensed 30th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.099 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.099 | 0.005 |
Based on advice provided by DECC (Pers. Comm. 2012), the high cost estimate is calculated using an estimate of the total number of future licence applications in blocks in the 26th Round with a discovery that is 25% higher than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed to be 50% higher than the number used to calculate the best estimate. Therefore:

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

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

Additional cost attributed to future licence applications in the 27th, 28th and 29th rounds, decommissioning and carbon capture and storage are as described in the estimate best estimate.
| Year       | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|---------------------|
| Additional costs to future applications in Licensed 26th | 0.108 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.391 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.499 | 0.025 |
| Additional costs to decommissioning licences (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.000 | 0.000 | 0.000 | 0.012 | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.000 | 0.000 | 0.000 | 0.000 | 0.047 | 0.002 |
| Additional costs to future CCS apps. (£m) | 0.000 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.000 | 0.051 | 0.000 | 0.000 | 0.000 | 0.205 | 0.010 |
| Additional costs to future applications in Licensed 27th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.319 | 0.016 |
| Additional costs to future applications in Licensed 28th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.434 | 0.021 |
| Additional costs to future applications in Licensed 29th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.043 | 0.022 |
| Additional costs to future applications in Licensed 30th | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.434 | 0.021 |
| Additional costs to future applications in Licensed 31st | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.883 | 0.044 |
| Total Costs (£m) | 0.108 | 0.000 | 0.000 | 0.051 | 0.012 | 0.000 | 0.000 | 0.051 | 0.000 | 1.747 | 0.000 | 0.051 | 0.000 | 0.000 | 0.012 | 0.051 | 0.000 | 0.000 | 0.012 | 2.095 | 0.105 |
| Present value cost (£m) | 0.108 | 0.000 | 0.000 | 0.046 | 0.010 | 0.000 | 0.000 | 0.040 | 0.000 | 1.282 | 0.000 | 0.035 | 0.000 | 0.000 | 0.007 | 0.031 | 0.000 | 0.000 | 0.006 | 1.565 | 0.078 |

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

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

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

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

### Ports and Harbours: Best Estimate

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<thead>
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<th>Year</th>
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<td>Cost to update assessment of environmental impact in future licence applications for navigational dredging only, incurred to ports within 5km of an MCZ that do not have a MDP.</td>
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102
Assumptions: Additional costs will be incurred for future licence applications for navigational dredging areas, disposal sites and port developments within 5km of an MCZ.

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

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

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

Costs for port development additional licence application costs are £0.007m per application (same unit cost as navigational dredging unit cost). It is assumed that each region will have some form of development over the 20 year IA period. The number of future port developments is based on MMO data on the number of licence applications received for port developments in each region over 2011 – 2013, for all regions the average number of applications was 56 per year. The assumption is that 50% of ports will incur this cost, this means for the full MCZ network there are 28 possible applications per year within 5km of an MCZ. Scaled down to 25% to represent the 3rd tranche of MCZs, consequently 7 proposed sites are expected to incur this costs for 1 application each years. This results in a cost of 7 x £0.007m = £0.050m. The sum of the cost for ports developments and disposal sites give a total of £0.050 + £0.041m = £0.091m per year. After adjusting to 2016 prices, this estimate equals £0.093m.
It is assumed that no mitigation will be required for sites proposed for designation in the 3rd tranche.

### Ports and Harbours: High Estimate (Option 2a)

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

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

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

Port development is as described in the best estimate. The sum of the cost for ports developments and disposal sites give a total of £0.050m + £0.310m = £0.361m per year. After adjusting to 2016 prices, this estimate equals £0.368m.
### Ports and Harbours: Low Estimate (option 1b)

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

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

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

### Recreation: Best Estimate

<p>| Year     | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|-------------------|
| Additional cost from management scenarios | 0.141 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 0.125 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 0.091 | 1.905 | 0.095 |</p>
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Assumptions: Costs arise when management of some recreation activities change due to the designation of an MCZ relative to baseline management. The best estimate is the mid-point between the low and high cost scenarios. (Studland Bay and Bembridge are the only MCZ proposed sites in tranche 3 bearing costs, whilst Cumbria Coast may be subject to a voluntary code of conduct for anchoring/mooring, which has not been costed). This results in the cost of (£0.095m + £0.181m)/2 = £0.138m for the first year and (£0.007m + £0.171m)/2 = £0.089m for each of the remaining 19 years of the 20 year IA.

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

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

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Present value costs (£m) | 1.280 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 1.269 | 25.397 | 1.270 |

**Total Costs**

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

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

### Recreation: Low Cost Estimate

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

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

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

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

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

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

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

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

No developments are expected to face mitigation costs as a result of MCZs, hence there is no sensitivity analysis for wind, wave and tidal developments. During consultation, a response from the Crown Estate highlighted wind developments near to Berwick to St Mary’s, Markham’s Triangle and Kentish Knock East. During
further correspondence, Crown Estate confirmed that they anticipated no additional costs associated with these developments due to no requirements of further EIAs, or uncertainty around the future of the development.

**Public Costs:**

**National Defence: Best Estimate (also low and high)**

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------------------|
| One-off transitional costs for adjustment of electronic tools and charts (£m) | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.000 |
| Annual Costs for maintenance of electronic tools and charts and costs to mitigate impacts of activity (£m) | 0.004 | 0.004 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.058 | 0.003 |
| Total costs (£m) | 0.010 | 0.004 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.064 | 0.003 |
| Present value costs (£m) | 0.010 | 0.004 | 0.004 | 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 | 0.001 | 0.001 |

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

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

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

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

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

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

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

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

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

### Ecological Survey: Baseline setting and monitoring. Best estimate (include low and high)

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | Total (£m) | Annual Average (£m) |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|---------------------|
| Total NE one-off costs (transitional baseline setting) (£m) | 1.149 | 1.149 | 1.149 | 1.149 | 1.149 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 6.891 | 0.345 |
| Total NE one-off costs (transitional baseline setting) (£m) | 0.042 | 0.042 | 0.042 | 0.042 | 0.042 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.251 | 0.013 |
### Assumptions

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

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

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

### Table

| Total JNCC one-off costs (transitional baseline setting) (£m) | 1.266 | 1.266 | 1.266 | 1.266 | 1.266 | 1.266 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 7.593 | 0.380 |
| Total NE one-off costs of monitoring (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 16.156 | 0.808 |
| Total NE one-off costs of monitoring (£m) HMS | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 17.718 | 0.886 |
| Total JNCC one-off costs of monitoring (£m) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 49.195 | 2.460 |

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

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

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

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

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

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

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

\begin{footnotesize}
\begin{footnotes}{
\textsuperscript{103} Our future fishing arrangements with the EU after EU exit will be a matter for negotiation.
\textsuperscript{104} 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
\textsuperscript{105} The data is based on a formal request to countries to provide data on affected revenues. This data was used for all but two of the sites listed in the table under "pers. comm. 2016/2017" with the exception of South West Approach to the Bristol Channel and East of Start Point. For these two sites, data were not available and in-house analyses were carried out instead. Some uncertainties still apply for the non-UK landing activities.
\end{footnotes}
\end{footnotesize}
<table>
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<tr>
<th>MCZ</th>
<th>Annual average non-UK revenues and data source(s) by country (£m/yr\textsuperscript{106} 2009-2015 average unless otherwise stated)</th>
<th>Total annual revenues potentially affected by management (£m/yr 2009-2015 average unless otherwise stated)\textsuperscript{107} \textsuperscript{108}</th>
</tr>
</thead>
</table>
| Cape Bank           | Belgium: 0.215 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)  
France: 0.190 (Mobile Gears\textsuperscript{109}) Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)\textsuperscript{110}  
Ireland: 0.013 (Bottom Mobile Gears); < 0.001 (Mid-water gear) Source: Marine Institute Ireland (pers. comms. 2016)  
Netherlands: < 0.001 (Mid-water mobile gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)\textsuperscript{111}  | Best Estimate: 0.053 (0.000 - 0.425) |
| South West Deeps (East) | Denmark: 0.286 (Mid-Water Mobile Gear) Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)  
France: 1.681 (Mobile Gear) Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)  
Ireland: 0.114 (Bottom Mobile Gear); 0.288 (Mid Water Mobile Gear); < 0.001 (Static); Source: Marine Institute Ireland (pers. comms. 2016)  | Best estimate: 0.229 (0.000 – 1.833) |

\textsuperscript{106} Where revenues were provided in Euros this has been converted to Pounds Sterling, using the average exchange rate corresponding to the price year of the revenue data used.  
\textsuperscript{107} Low and high estimates are calculated based on each site’s respective lowest and highest management scenarios as outlined in Annex A. The best estimate is calculated from the highest scenario, but with the following assumptions: only 50% of estimated value landed via mobile gear will be affected, only 25% of estimated value landed via static gear will be affected, 75% of commercial fishing activity will be displaced to other locations, the other 25% will be lost.  
\textsuperscript{108} All figures expressed in this column have been adjusted to 2016 prices.  
\textsuperscript{109} Data from this source does not differentiate bottom mobile gear and mid-water mobile gear. For this analysis, the value of landings from French vessels using mobile gear, has been included in the total revenue of bottom-abrading gears.  
\textsuperscript{110} All revenue figures from this source is based on 2013 only  
\textsuperscript{111} All revenue figures from this source are an average of 2010 – 2015
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<th>Location</th>
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</table>
| Netherlands: 0.932 (Mid-Water Mobile Gear) | Source: Dutch Ministry of Economic Affairs (per. comms. 2016)                                                                                                                                               | Total Revenue Bottom-Abrading Gears: 1.796  
Total Non-UK Revenue: 3.302 |
| Belgium: 0.061 (Bottom Mobile Gear) | Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)                                                                                                                      | Best estimate: 0.182  
(0.000 - 1.453) |
| Denmark: 0.002 (Mid-Water Mobile Gear) | Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)                                                                                                                                   |                        |
| France: 0.097 (Mobile Gear)       | Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)                                                                                                                                       |                        |
| Ireland: 1.266 (Bottom Mobile Gear); 0.228 (Mid-Water Mobile Gear); 0.014 (Static) | Source: Marine Institute Ireland (pers. comms. 2016)                                                                                                                                                     |                        |
| Netherlands: < 0.001 (Mid-Water Mobile Gear) | Source: Dutch Ministry of Economic Affairs (per. comms. 2016)                                                                                                                                               |                        |
| South of the Isles of Scilly: 0.065 (Mobile Gear) | Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)                                                                                                                                       | Total Revenue Bottom-Abrading Gears: 0.065  
Total Non-UK Revenue: 0.065 |
| North East of Haig Fras: 0.040 (Bottom Mobile Gear) | Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)                                                                                                                                                      | Best estimate: 0.052  
(0.000 – 0.420) |
<p>| France: 0.159 (Mobile Gear)       | Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)                                                                                                                                       |                        |</p>
<table>
<thead>
<tr>
<th></th>
<th>Ireland: 0.213 (Bottom Mobile Gear); 0.001 (Mid-Water Mobile Gear); 0.003 (Static)</th>
<th><strong>Total Revenue Bottom-Abrading Gears:</strong> 0.412</th>
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<tbody>
<tr>
<td></td>
<td>Source: Marine Institute Ireland (pers. comms. 2016)</td>
<td><strong>Total Non-UK Revenue:</strong> 0.416</td>
</tr>
<tr>
<td></td>
<td><strong>Goodwin Sands</strong></td>
<td>Best Estimate: 0.018 (0.000 – 0.144)</td>
</tr>
<tr>
<td></td>
<td>Belgium: 0.141 (Bottom mobile gear); &lt; 0.001 (Mid-water mobile gear); 0.003 (static gear)</td>
<td>Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</td>
</tr>
<tr>
<td></td>
<td>Denmark: 0.001 (Mid-Water Mobile Gear); &lt; 0.001 (Static gear)</td>
<td>Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</td>
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<tr>
<td></td>
<td>France: &lt; 0.001 (mobile gear)</td>
<td>Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</td>
</tr>
<tr>
<td></td>
<td>Netherland: &lt; 0.001 (bottom mobile gear)</td>
<td>Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</td>
</tr>
<tr>
<td></td>
<td><strong>Total Revenue Bottom-Abrading Gears:</strong> 0.141</td>
<td><strong>Total Non-UK Revenue:</strong> 0.145</td>
</tr>
<tr>
<td></td>
<td><strong>Inner Bank</strong></td>
<td>Best estimate: 0.111 (0.000 – 0.888)</td>
</tr>
<tr>
<td></td>
<td>Belgium: 0.592 (Bottom Mobile Gear); &lt;0.001 (Mid-Water Mobile Gear); &lt; 0.001 (Static Gear)</td>
<td>Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</td>
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<td></td>
<td>Denmark:  0.003 (Mid-Water Mobile Gear)</td>
<td>Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</td>
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<td></td>
<td>France: 0.274 (Mobile Gear)</td>
<td>Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</td>
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<td></td>
<td>Ireland: 0.002 (Bottom Mobile Gear); &lt; 0.001 (Static Gear)</td>
<td>Source: Marine Institute Ireland (pers. comms. 2016)</td>
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<tr>
<td>Area</td>
<td>Belgium</td>
<td>Denmark</td>
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<tr>
<td>Foreland</td>
<td>0.141 (Bottom Mobile Gear); &lt; 0.001 (Mid-Water Mobile Gear); 0.003 (Static Gear)</td>
<td>0.001 (Mid Water Mobile Gear); &lt; 0.001 (Static)</td>
</tr>
<tr>
<td>Kentish Knock East</td>
<td>0.185 (Bottom Mobile Gear); &lt; 0.001 (Static gear)</td>
<td>0.007 (Mobile gear)</td>
</tr>
<tr>
<td>Location</td>
<td>Total Revenue Bottom-Abrading Gears:</td>
<td>Total Non-UK Revenue:</td>
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<tr>
<td><strong>Orford Inshore</strong></td>
<td>0.325</td>
<td>0.325</td>
</tr>
<tr>
<td>Belgium: 0.058 (Bottom Mobile Gear)</td>
<td>Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</td>
<td></td>
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<tr>
<td>France: 0.003 (Mobile Gear)</td>
<td>Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</td>
<td></td>
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<tr>
<td>Netherlands: &lt; 0.001 (Bottom Mobile Gear)</td>
<td>Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</td>
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<tr>
<td><strong>Holderness Offshore</strong></td>
<td>0.120</td>
<td>0.120</td>
</tr>
<tr>
<td>Belgium: 0.010 (Bottom mobile gear)</td>
<td>Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</td>
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<tr>
<td>Denmark: &lt; 0.001 (Bottom mobile gear); 0.003 (mid-water mobile gear); &lt; 0.001 (static gear)</td>
<td>Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</td>
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<tr>
<td>France: 0.099 (Mobile gear)</td>
<td>Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</td>
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<tr>
<td>Netherlands: 0.012 (bottom mobile gear)</td>
<td>Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</td>
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<tr>
<td><strong>Markham’s Triangle</strong></td>
<td>0.150</td>
<td>0.150</td>
</tr>
<tr>
<td>Belgium: 0.151 (Bottom Mobile Gear)</td>
<td>Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</td>
<td></td>
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<tr>
<td>Denmark: 0.040 (Bottom Mobile Gear); 0.053</td>
<td>Source: Denmark Institute for Agricultural and Fisheries Research (pers. comms. 2017)</td>
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<tr>
<td>Location</td>
<td>Revenue Details</td>
<td>Total Revenue Bottom-Abrading Gears</td>
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<tr>
<td>South Rigg</td>
<td>Belgium: 0.010 (Bottom Mobile Gear)</td>
<td>0.024</td>
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<td></td>
<td>Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</td>
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<tr>
<td></td>
<td>Ireland: 0.012 (Bottom Mobile Gear); 0.001 (Mid-Water Gear)</td>
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<td></td>
<td>Source: Marine Institute Ireland, pers. comms. 2016</td>
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<tr>
<td></td>
<td>Netherlands: 0.002 (Bottom Mobile Gear); 0.002 (Mid-Water Mobile Gear)</td>
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<td></td>
<td>Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</td>
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<tr>
<td>Queenie Corner</td>
<td>Belgium: 0.040 (Bottom Mobile Gear)</td>
<td></td>
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<tr>
<td></td>
<td>Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</td>
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<tr>
<td></td>
<td>Ireland: 0.976 (Bottom Mobile Gear); 0.001 (Mid-water Mobile Gear); &lt; 0.001 (Static Gear)</td>
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<tr>
<td></td>
<td>Source: Marine Institute Ireland (pers. comms. 2016)</td>
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<tr>
<td></td>
<td>Netherlands: 0.002 (Bottom Mobile Gear);</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Revenue Bottom-Abrading Gears</td>
<td>Non-UK Revenue</td>
</tr>
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</tr>
<tr>
<td><strong>South-West Approaches to the Bristol Channel</strong></td>
<td>0.002 (Mid-Water Mobile Gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</td>
<td>Total Revenue: 1.019 Total Non-UK Revenue: 1.021</td>
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<td><strong>West of Copeland</strong></td>
<td>Formal request was not submitted to countries. N/A¹¹²:</td>
<td></td>
</tr>
<tr>
<td><strong>East of Start point⁹</strong></td>
<td>Formal request was not submitted to countries. N/A</td>
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</tbody>
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<tr>
<th>Total</th>
<th></th>
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</table>

¹¹² Data for this site could not be collected directly from member states. Some in-house analysis was carried out but due to some uncertainties on non-UK revenues figures are not included here.
Annex F: Additional features to be included in existing first and second tranche Marine Conservation Zones (MCZs)

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

Chesil Beach and Stennis Ledges

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

Cumbria Coast

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

Dover to Deal

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

East of Haig Fras`

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

Isles of Scilly sites

The Isles of Scilly MCZ sites are composed of 11 inshore sites and lie approximately 45 km southwest of the Cornish coast. Additional features will be designated in four of these sites and these are listed below. There are no additional costs to business attributable to the inclusion of these features.
Isles of Scilly- Bristows to the Stones
This site protects 28 km². The two additional features to be designated are moderate
energy circalittoral rock and subtidal coarse sediment.

Isles of Scilly- Higher Town
This site protects 2 km². The additional feature to be designated is stalked jellyfish
(*Calvadosia cruxmelitensis*).

Isles of Scilly- Men a Vaur to White Island
This site protects 4 km². The additional feature to be designated is giant goby (*Gobius
cobitis*).

Isles of Scilly- Peninnis to Dry Ledge
This site protects 3 km². The additional feature to be designated is stalked jellyfish
(*Calvadosia cruxmelitensis*).

Medway Estuary
Medway Estuary MCZ is an inshore site located on the Kent coast that protects an area of
60 km². The additional feature to be designated is smelt (*Osmerus eperlanus*) and a small
extension (approximately 1.4 km²) is also to be made to the site boundary. There are no
additional costs to business attributable to the inclusion of this feature.

Poole Rocks
Poole Rocks MCZ is an inshore site that covers an area of 4 km². It is located in the
Eastern Channel, east of the entrance to Poole Harbour. The one additional feature to be
designated is black bream (*Spondyliosoma cantharus*). The addition of this feature will incur
an estimated cost of £312 per year to the commercial fishing sector and £45,000 per year
to the recreational sector.

South Dorset
South Dorset MCZ is an inshore site located off the south coast of Dorset, south-east of
Swanage. The site protects an area of 193 km². The additional feature to be designated is
high energy circalittoral rock. There are no additional costs to business attributable to the
inclusion of this feature.

Thanet Coast
Thanet Coast MCZ is an inshore site located on the Kent coast that protects an area of 64
km². The additional feature to be designated is stalked jellyfish (*Haliclystus auricula*). There
are no additional costs to business attributable to the inclusion of this feature.

The Canyons
The Canyons MCZ is an offshore site located to the far south-west corner of the UK’s
continental shelf area. The site protects an area of around 661 km² and lies more than 330
km from the Cornish coast. The two additional features to be designated are coral gardens and sea pen & burrowing megafauna. There are no additional costs to business attributable to the inclusion of these features.

**Torbay**

Tobay MCZ is an inshore site on the South Devon coast that protects an area of 20 km². The two additional features to be designated are peacock’s tail (*Padina pavonica*) and subtidal coarse sediment. There are no additional costs to business attributable to the inclusion of these features.

**Whitsand and Looe Bay**

The Whitsand and Looe Bay MCZ is an inshore site located off the south coast of Cornwall. The site protects an area of 52 km². The four additional features to be designated are giant goby (*Gobius cobitis*), moderate energy circalittoral rock and stalked jellyfish species (*Calvadosia campanulata* and *Calvadosia cruxmelitensis*). There are no additional costs to business attributable to the inclusion of these features.
Annex G: Summary of sites to be designated in the third tranche of Marine Conservation Zones (MCZs)

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

Albert Field (1)

This is an inshore site located off the south coast of England within the Eastern Channel region, approximately 20 km south of the entrance to Poole Harbour. It extends from the 6 nm limit at its northern boundary to the 12 nm limit at its southern boundary. This site covers approximately 192 km². This site will protect subtidal coarse sediment and subtidal mixed sediment.

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

Axe Estuary (2)

This is an inshore site located near Seaton in Devon in the Eastern Channel region. The site covers an area of 0.33 km². The site will protect estuarine rocky habitats, intertidal coarse sediment, coastal saltmarsh and saline reedbeds, intertidal mixed sediment and intertidal mud.

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

Beachy Head East (3)

This is an inshore site located in the Eastern Channel region on the South East Coast of England and covering an area of 195 km². The site will protect high/moderate energy circalittoral rock, littoral chalk communities, subtidal sand, subtidal coarse sediment, short-snouted seahorse (*Hippocampus hippocampus*), subtidal chalk, peat and clay exposures and ross worm reefs (*Sabellaria spinulosa*).

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

Bembridge (4)

This is an inshore site located adjacent to the east coast of the Isle of Wight and covering an area of 75 km² within the Eastern Channel region. The site will protect sheltered muddy gravels, short-snouted seahorse (*Hippocampus hippocampus*), stalked jellyfish (*Haliichystus* species and *Calvadosia campanulata*), subtidal coarse sediment, subtidal sand, native oyster (*Ostrea edulis*), seagrass beds, maerl beds, sea pens and burrowing megafauna, peacock’s tail (*Padina pavonica*), subtidal mixed sediments and subtidal mud.
The cost estimates for the site are approximately £6k per year relating to the commercial fishing sector, £4k per year relating to the ports and harbours sector, £600 per year to the renewables sector and £300 per year to recreation.

**Berwick to St Mary’s** (5)

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

Collectively, the new site will cover an area of 634 km². The site will protect breeding and non-breeding common eider (*Somateria mollissima*).

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

**Camel Estuary** (6)

This is an inshore site located near Wadebridge in north Cornwall in the Western Channel and Celtic Sea region and covering an area of 2.2 km². The site will protect estuarine rocky habitats, intertidal coarse sediment, coastal saltmarsh and saline reedbeds, intertidal mud, and low energy intertidal rock.

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

**Cape Bank** (7)

This is an inshore site located west of Land’s End, Cornwall within the Western Channel and Celtic Sea region and covering an area of 474 km². The site will protect subtidal coarse sediment and moderate energy circalittoral rock.

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

**Dart Estuary** (8)

This is an inshore site located in South Devon within the Western Channel and Celtic Sea region. It covers an area of approximately 5 km². The site will protect tentacled lagoon-worm (*Alkmaria romijni*), coastal saltmarshes and saline reedbeds, intertidal mud, low energy intertidal rock and estuarine rocky habitats.

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

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113 Previously called Coquet Island.
Devon Avon Estuary (9)

This is an inshore site located in the Western Channel and Celtic Sea region on the south West Coast. The site covers an area of approximately 2 km². The site will protect coastal saltmarshes and saline reedbeds, intertidal mud, intertidal sand and muddy sand, moderate energy intertidal rock and tentacled lagoon-worm (*Alkmaria romijni*).

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

East of Start Point (10)

This is an offshore site located south of Lyme bay and Torbay SAC within the Eastern Channel region. The site covers an area of 116 km². The site will protect subtidal sand and will improve connectivity between inshore and offshore sites protecting subtidal sediment habitats.

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

Erme Estuary (11)

This is an inshore site located on the south coast of Devon in the Western Channel and Celtic Sea region. The site covers an area of approximately 1 km². The site will protect estuarine rocky habitats, sheltered muddy gravels, tentacled lagoon-worm (*Alkmaria romijni*), high energy intertidal rock, intertidal mixed sediments, low energy intertidal rock, moderate energy intertidal rock and intertidal coarse sediment.

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

Foreland (12)

This is an inshore site located in the Southern North Sea and Eastern Channel regions extending along the mid-channel between Kent and France. The site covers 244 km². The site will protect subtidal sand, subtidal coarse sediment, high energy circalittoral rock, moderate energy circalittoral rock and the geological English Channel outburst flood features.

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

Goodwin Sands (13)

This is an inshore site located off Sandwich Bay on the Kent coast within the Southern North Sea region. The site covers 277 km². The site will protect subtidal coarse sediment, subtidal sand, moderate energy circalittoral rock, ross worm reefs (*Sabellaria spinulosa*), blue mussel beds and the geological English Channel outburst flood features.
The cost estimates for the site are approximately £4k per year relating to the ports and harbours sector, £2k per year relating to the commercial fishing sector and £1k per year relating to aggregates.

**Helford Estuary (14)**

This is an inshore site located on the south coast of Cornwall within the Western Channel and Celtic Sea region and covering an area of 6 km². The site will protect native oyster (*Ostrea edulis*).

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

**Holderness Offshore (15)**

This is a large site that straddles the inshore and offshore areas within the Southern North Sea region and is located 11 km off the Holderness Coast. The site covers an area of 1176 km². The site will protect subtidal coarse sediment, subtidal mixed sediment, subtidal sand, ocean quahog (*Arctica islandica*) and the North Sea glacial tunnel valleys.

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

**Inner Bank (16)**

This site straddles the inshore and offshore areas and is located within the Eastern Channel. The site covers an area of 199 km² and will protect subtidal coarse sediment, subtidal sand and subtidal mixed sediments.

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

**Kentish Knock East (17)**

This is an inshore site located between the 6nm and 12nm lines in the Outer Thames Estuary within the Southern North Sea region. This site covers an area of 96 km² and will protect subtidal sand, subtidal coarse sediment and subtidal mixed sediments.

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

**Markham’s Triangle (18)**

This is an offshore site located approximately 137 km from the Humberside coastline in the Southern North Sea region. This site covers an area of 200 km² and will protect subtidal sand, subtidal coarse sediment, subtidal mud and subtidal mixed sediments.
The overall cost estimate for this site is approximately £200 per year relating to commercial fishing.

**Morte Platform (19)**

This is an inshore site located approximately 5 km off the coast of North Devon in the Western Channel and Celtic Sea region. The site covers an area of 25 km² and will protect subtidal coarse sediment, high energy circalittoral rock and moderate energy circalittoral rock.

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

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

This an offshore site located in the Western Channel and Celtic Sea region. The site covers an area of 464 km² and will protect subtidal coarse sediment, subtidal sand and subtidal mud.

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

**North West of Lundy (21)**

This is an offshore site extending in an arc between the 6nm and 12nm limits, and located 15 km northwest of Lundy Island within the Western Channel and Celtic Sea region. The site covers an area of 173 km² and will protect subtidal coarse sediment.

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

**Orford Inshore (22)**

This is an inshore site that is located within the Southern North Sea region approximately 14 km offshore from the Alde Ore Estuary on the Suffolk coast. The site covers an area of 72 km² and will protect subtidal mixed sediments.

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

**Otter Estuary (23)**

This is a small inshore site that is located near Budleigh Salterton in Devon in the Eastern Channel region. The site covers an area of 0.11 km² and will protect coastal saltmarshes and saline reedbeds, intertidal coarse sediment and intertidal mud.

The site has a low level of human activity and no costs are expected to be incurred for this site.
Purbeck Coast (24)

This is an inshore site within the Eastern Channel region that stretches from Ringstead Bay in the west to Swanage Bay in the east and covers an area of 282 km². The site will protect high energy intertidal rock, intertidal coarse sediment, moderate energy intertidal rock, stalked jellyfish (*Haliclystus* species), maerl beds, peacock’s tail (*Padina pavonica*), subtidal coarse sediment, subtidal mixed sediment and nesting black bream (*Spondylus canthus*) during the breeding season (April to July).

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

Queenie Corner (25)

This offshore site is located in the Western Irish Sea, within the Irish Sea region and covers an area of 146 km². The site will protect subtidal mud and sea pen & burrowing megafauna communities.

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

Ribble Estuary (26)

This is an inshore site within the Irish Sea region located on the north-west coast of England, near Preston. The site covers an area of 15 km² and will protect smelt (*Osmerus eperlanus*).

No costs are expected to be incurred for this site.

Selsey Bill and the Hounds (27)

This is an inshore site located in the Eastern Channel region on the South East coast, and covering an area of approximately 16 km². The site will protect peat and clay exposures, short-snouted seahorse (*Hippocampus hippocampus*), subtidal mixed sediments, subtidal sand, high energy infralittoral rock, moderate energy infralittoral rock, moderate energy cirralittoral rock, low energy infralittoral rock and the Bracklesham Bay geological feature. The cost estimates for the site are approximately £700 per year relating to commercial fishing and £300 per year relating to the renewables sector.

Solway Firth (28)

This in an inshore site within the Irish Sea region located in the Solway Firth Estuary, Cumbria, in the far north-eastern Irish Sea. The site covers an area of 45 km² and will protect smelt (*Osmerus eperlanus*).

The overall cost estimate for the site is approximately £2k per year relating to the ports and harbours sector.
South of Celtic Deep (29)

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

South of Isles of Scilly (30)

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

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

South of Portland (31)

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

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

South Rigg (32)

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

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

South West Approaches to the Bristol Channel (33)

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

The overall cost estimate for the site is approximately £12k per year relating to the commercial fishing sector.
South West Deeps (East) (34)

This is a large offshore site located approximately 190 km southwest off Land’s End in the Western Channel and Celtic Sea region. The site covers an area of 4,653 km² and will protect subtidal coarse sediment, subtidal sand, deep-sea bed and the Celtic Sea Relict Sandbanks geomorphological feature.

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

Southbourne Rough (35)

This is an inshore site located within the Eastern Channel region in Poole Bay, to the east of Poole Rocks MCZ. The site covers an area of around 5 km² and will provide protection for nesting black bream (*Spondyliosoma cantharus*) during the breeding season (April to July).

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

Studland Bay (36)

This in an inshore site located within the Eastern Channel region on the Dorset coast, south of Poole. The site covers an area of 4 km². The site will protect intertidal coarse sediment, long-snouted seahorse (*Hippocampus guttulatus*), subtidal sand and seagrass beds.

The cost estimates for this site are approximately £93k per year relating to the recreational sector, £20k per year to the ports and harbours sector and £400 per year to commercial fishing.

Swanscombe (37)

This is an inshore site located within the Southern North Sea region in the Thames Estuary. The site covers an area of 3 km² and will protect tentacled lagoon-worm (*Alkmaria romijni*) and intertidal mud.

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

West of Copeland (38)

This is an offshore site located within the Irish Sea region in the east of the Irish Sea. The site covers an area of 158 km² and will protect subtidal coarse sediment, subtidal sand and subtidal mixed sediments.

The overall cost estimate for this site is approximately £200 per year relating to the commercial fishing sector.
West of Wight Barfleur (39)

This is an offshore site located approximately 12 km south of the South Dorset MCZ in the Eastern Channel region. The site covers an area of 138 km² and will protect subtidal coarse sediment and subtidal mixed sediments.

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

Wyre Lune (40)

This is an inshore site located in the southern part of Morecambe Bay, Lancashire, in the Irish Sea region. The site covers an area of approximately 92 km² and will protect smelt (*Osmerus eperlanus)*.

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

Yarmouth to Cowes (41)

This is an inshore site located within the Eastern Channel region along the northwest coast of the Isle of Wight. The site covers an area of 16 km². The site will protect estuarine rocky habitats, intertidal coarse sediment, intertidal under-boulder communities, littoral chalk communities, low energy intertidal rock, moderate energy intertidal rock, subtidal coarse sediment, high energy circalittoral rock, high energy infralittoral rock, moderate energy circalittoral rock, moderate energy infralittoral rock, native oyster (*Ostrea edulis*), peat and clay exposures, sheltered muddy gravels, subtidal chalk, subtidal mixed sediments, subtidal mud and the Bouldnor Cliff geological feature.

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