Annex I2 Direct impacts arising from individual rMCZs (Finding Sanctuary) Part 2

Contents

rMCZ Reference Area Lundy

Site area (km^2): 3.7

Table 1. Conservation impacts **rMCZ Reference Area Lundy**

1a. Ecological description

Recommended Marine Conservation Zone (rMCZ) Reference Area Lundy is identical to the boundary of the existing Lundy No Take Zone and sits within the Lundy MCZ and Special Area of Conservation. The site extends from the shoreline to depths of approximately 30 metres below sea level.

Lundy is a small island lying 18km off the north Devon coast. Most of the island is formed of granite, with softer slate in the south-east corner, off the south coast and offshore of the north coast. Rock type strongly influences the shores of the island: the majority of the coast comprises steep granite cliffs with inaccessible shores of granite boulders below. A breeding colony of grey seal *Halichoerus grypus* is present on the island.

The full salinity reefs are both infralittoral and circalittoral (>50 metres depth), and are highly influenced by coastal processes. Several communities at their northern limit of distribution occur here. Fragile long-lived species such as the soft coral *Parerythropodium coralloides*, sea-fan *Eunicella verrucosa* and erect branching sponges are present, as are all five British species of cup coral.

The communities of benthic fauna around Lundy are unusually rich, with many rare and delicate slow-growing species. The highest diversity of fauna and flora is present in conditions of weak wave action but moderate tidal streams, mainly in the northern part of the east coast of Lundy. Many of the conspicuous Mediterranean–Atlantic elements of the fauna have been recorded in that area. For example, the rare alga *Carpomitra costata*, red sea-fingers *Alcyonium glomeratum*, the anemones *Parazoanthus axinellae* and *Aiptasia mutabilis* and the southern species of cup coral *Leptopsammia pruvoti*.

There is a particularly rich diversity of seaweeds: 316 species have been recorded. This may, in part, be a reflection of survey effort and the intense study that the site has been subjected to by phycologists over the past 60 years, but it is considered genuinely very rich. It is the most northerly site for *Laminaria ochroleuca* in the UK. The communities of benthic fauna are also unusually rich, with many rare and delicate slow-growing species. A number of nationally rare and scarce species have been recorded from coarse sediments around Lundy, including the sea squirt *Molgula oculata* and the brown seaweed *Choristocarpus tenellus*.

Seahorses *Hippocampus hippocampus* and *Hippocampus guttulatus*, crawfish *Palinurus elephas*, *Phymatolithon calcareum, Leptopsammia pruvoti* and *Eunicella verrucosa* have all been recorded in the site (Lieberknecht and others, 2011). Lundy is considered to be a regionally important sea bird colony and is one of only two sites in England where Manx shearwater *Puffinus puffinus* breed (RSPB, pers. comm., 2012).

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				

Moderate energy circalittoral rock	0.04	-	Unfavourable Condition	Recover to Reference Condition
Moderate energy infralittoral rock	0.99	-	Unfavourable Condition	Recover to Reference Condition
Subtidal coarse sediment	0.14	-	Unfavourable Condition	Recover to Reference Condition
Subtidal sand	2.53	-	Unfavourable Condition	Recover to Reference Condition
Habitats of Conservation Importance				
Mud habitats in deep water	-	12	Unfavourable Condition	Recover to Reference Condition
Fragile sponge and anthozoan communities on subtidal rocky habitats	-	1	Unfavourable Condition	Recover to Reference Condition
Species of Conservation Importance				
Amphianthus dohrnii	-	1	Unfavourable Condition	Recover to Reference Condition
Leptopsammia pruvoti	-	12	Unfavourable Condition	Recover to Reference Condition
Phymatolithon calcareum	-	1	Unfavourable Condition	Recover to Reference Condition
Eunicella verrucosa	-	37	Unfavourable Condition	Recover to Reference Condition
Palinurus elephas	-	2	Unfavourable Condition	Recover to Reference Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ Reference Area Lundy**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**

Table 2a. Archaeological heritage	**rMCZ Reference Area Lundy**
Numerous archaeological features are recorded in the site including the Gull Rock and Iona II wrecks which are both designated as historic shipwrecks under the Protection of Wrecks Act 1973. Since 2003, between one and six licences have been granted each year to visit or survey these wrecks. Ten further wrecks are recorded in the site as well as a report of an undated stone anchor (English Heritage, 2010). Scheduled monuments are identified on the boundary of the site including a gun battery, a widow's tenement, medieval and prehistoric settlement sites, a medieval settlement immediately south of Halfway Wall and a granite quarry on east sidelands. The Heroine and Robert wrecks are also located nearby (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impacts made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known so no overall cost to the sector has been estimated. However, the additional cost in one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). If archaeologists respond to the prohibition of excavation by undertaking an alternative archaeological excavation in another locality, this could result in additional costs to the archaeologists. As it is not possible to predict when or how often this could occur, this is not costed in the Impact Assessment. The prohibition of excavation and therefore interpretation of archaeological evidence from the site will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society. As a result of the rMCZ, English Heritage may incur additional costs in its condition assessment of the protected wrecks, which would have significant implications for protected wrecks that are considered to be 'heritage at risk'.

Table 2b. Renewable energy	**rMCZ Reference Area Lundy**
Source of costs of the rMCZ	
Management scenario 1: Installation of devises and cables not permitted with the rMCZ. Increase in costs of assessing environmental impacts for licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Tidal energy: The rMCZ overlaps with the Lundy and Outer Severn tidal energy Potential Development Area (PDA) (PMSS, 2010). Any likely installation could have a footprint within the PDA of 5km^2 (PMSS, 2010). While the rMCZ overlaps the PDA, it is considered unlikely that an installation would be proposed for the area within the rMCZ (Finding Sanctuary Steering	***Tidal energy:*** The estimated cost to tidal energy developers of this rMCZ is estimated at:

£m (one-off cost)	Scenario 1
Cost to the operator	0.013

Table 2b. Renewable energy	**rMCZ Reference Area Lundy**
Group renewable energy representative, pers. comm., 2011). The areas of significant tidal stream resource are identified as being to the south and north of Lundy Island, outside the rMCZ (PMSS, 2010). Given this, it is also unlikely that any inter-array or export cables will need to pass through the rMCZ. One potential energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015–20 (Department of Energy and Climate Change [DECC], pers. comm., 2011). By 2030 the development in the PDA is expected to have a production capacity of 210MW (PMSS, 2010).	The analysis assumes that the potential future tidal energy installation is planned within close proximity to the rMCZ. As a result of the designation of the rMCZ, the potential licence application for the tidal energy installation will need to consider the possible effects of the construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.013m in 2015. Costs associated with the prohibition of construction of an energy installation within the rMCZ are not included as a proposal for a development within the rMCZ is not considered to be likely. As no cables are anticipated to be sought that would pass through the rMCZ, no additional costs associated with re-routing cables around the rMCZ are anticipated.

Table 2c. Recreation	**rMCZ Reference Area Lundy**
Source of costs of the rMCZ ***Recreational boating management scenario:*** Closure of the rMCZ to anchoring (except in emergency). ***Scuba diving/snorkelling management scenario:*** Closure of the rMCZ to anchoring of vessels (except in emergency) and use of shot lines.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Recreational boating: There is occasional anchoring of recreational boats within the rMCZ, particularly at Gannet's Rock/Gannet's Bay when conditions are bad. Otherwise anchoring occurs outside the rMCZ, mainly in the Landing Bay area south of the rMCZ (Lundy wardens, pers. comm., 2011). There is a considerable amount of motorised and non-motorised boating within the rMCZ: kayaks, yachts and fishing boats in particular are used during the summer. There is also some use of personal watercraft. Anchoring by recreational vessels within the rMCZ is thought to be minimal (Natural England, pers. comm., 2011).	Alternative anchorage (in good weather conditions) is available to the south of the rMCZ. It is anticipated that the recreational vessel users who occasionally anchor in the rMCZ will respond to the closure (except in emergency) by anchoring at this alternative location. It is not anticipated that the closure will significantly impact on recreational boat users in the area (Lundy wardens, pers. comm., 2011). However, because the rMCZ will close a known bad weather anchorage, this may result in increased risks to the safety of recreational boaters.
Scuba diving/snorkelling: Scuba diving and snorkelling occur regularly in the rMCZ, mostly by organised groups with experienced divers and snorkellers (Natural England, pers. comm., 2011). It is estimated that 1,370 diver days (1 person diving for 1 day) occur at Lundy each year, around 60% of which occur within the rMCZ (equating to 820 diver days) (Lundy wardens, pers. comm., 2011). Each year there are between 160 and 300 overnight stays by divers on Lundy (Lundy wardens, pers. comm., 2011). It is understood that shot lines are rarely used, although boats do anchor inside the rMCZ, within Gannet's Bay, which is one of the main dive locations at Lundy (Lundy wardens, pers. comm., 2011). There are typically up to 3 boats at Gannet's Bay at any one time, but this can increase to 6 on busy days (Lundy wardens, pers. comm., 2011). There are 2 permanent moorings in the bay which can accommodate up to 3 boats, with any additional boats anchoring in the bay.	Shot lines are rarely used, and their prohibition is unlikely to significantly affect diving in the area (Lundy wardens, pers. comm., 2011). Prohibiting anchoring (except in emergency) may affect diving, particularly at Gannet's Bay, which is one of the main dive locations at Lundy. This will prevent more than 3 boats from conducting dives at Gannet's Bay at any one time, as the capacity of the existing moorings is 3 boats (Lundy wardens, pers. comm., 2011). On busy days, currently up to 6 boats anchor in the rMCZ. The edge of the rMCZ is over 1km from the bay, and anchoring outside the rMCZ does provide a viable alternative anchoring location for diving at in the bay (Lundy wardens, pers. comm., 2011). It will not be possible to install additional moorings as depositional activities are not permitted in rMCZ reference areas (JNCC and Natural England, 2010). This reduction in boat anchoring capacity at Gannet's Bay is expected to result in a potentially significant reduction in the overall number of divers visiting Lundy each year and/or a reduction in the quality of the diving experience available at Lundy.

Table 2d. Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ Reference Area Lundy**
Oil and gas related activities (including carbon capture and storage): This rMCZ overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 26th or 27th Seaward Licensing Rounds). However, the area is not necessarily viable to develop. Impacts of rMCZs on the oil and gas related activities are assessed in the Evidence Base, Annex H10 and Annex N9 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Reference Area Lundy**
Ports, harbours, shipping & disposal sites (excluding anchoring – see 'recreation'); research and education.	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ Reference Area Lundy**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. Circalittoral and infralittoral rock are important habitats for inshore commercial fisheries species, particularly crabs and lobsters, as are subtidal sediments (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition. As the rMCZ overlaps with an existing No Take Zone, no fishing activity currently occurs in the rMCZ.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. The rMCZ covers an existing No Take Zone and no additional management (above that in the baseline situation) of fishing activities is expected. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Localised beneficial spill-over effects may occur around the rMCZ. As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ Reference Area Lundy**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition (see Table 1b). As the rMCZ overlaps the existing No Take Zone, no angling is currently permitted and therefore no there is no on-site value of angling.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits to fish populations. It is unclear whether any benefits to fish populations would arise as a result of reduced fishing mortality due to management of commercial fishing (see Table 4a). As angling will continue to be prohibited within the rMCZ, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers. Such benefits may be insignificant.	Anticipated direction of change: ⟺ Confidence: Moderate
Diving: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided	If the conservation objectives of the features are achieved, the features will be recovered to reference condition.	Anticipated direction of change: ⇧

Table 4b. Recreation		**rMCZ Reference Area Lundy**
is assumed to be commensurate with that provided by the features of the site when not in reference condition. Lundy Island is a popular place for diving and several charter boats take divers to the best sites. There are diving facilities on the island, including changing areas and a compressor and air bank. It has not been possible to estimate the value of diving in the rMCZ.	An improvement in the condition of site features and any associated increase in abundance and diversity of species, which may include recovery of fragile and slow-growing species, may improve the quality of diving at the site and therefore the value of the ecosystem service. The designation is not expected to result in an increase in the number of visits, due to anticipated restrictions on anchoring (see Table 2c).	Confidence: Low
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition. Wardens on Lundy offer guided walks to introduce visitors to the island's wildlife, including flora and fauna on and around the island, the sea bird colonies in Jenny's Cove and guillemots, razorbills, fulmars and puffins. 'Snorkelling Safaris' take visitors into the water to see the marine life, including basking shark and grey seal. It has not been possible to estimate the value of wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. An improvement in the condition of site features and any associated increase in abundance and diversity of species that are visible to wildlife watchers may improve the quality of wildlife watching at the site and therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	Anticipated direction of change: ⇧ Confidence: Low

Table 4c. Research and education		**rMCZ Reference Area Lundy**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. Before becoming an MCZ, the area around Lundy was one of only three Marine Nature Reserves (MNRs) in the UK, including a No Take Zone area.	As an rMCZ Reference Area, the site will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures. It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧

Table 4c. Research and education		**rMCZ Reference Area Lundy**
The marine environment around Lundy has been the subject of a large number and variety of research projects, from species monitoring to environmental valuation studies. Much of the scientific work carried out on the island is organised and published through the Lundy Field Society. It has not been possible to estimate the value derived from research activities associated with the rMCZ.		Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. Education activities are provided to the public and schools through local interpretation and guided walks led by Lundy wardens. At one point, Lundy was one of only three MNRs in the UK and its status has meant that it has contributed to, and been featured in, a number of national-level public education programmes, such as television documentaries. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events on the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services		**rMCZ Reference Area Lundy**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Due to their depth and low-energy regime, deep water mud habitats are very stable and often highly	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Improved habitat condition and a reduction in anthropogenic pressures may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ Reference Area Lundy**
diverse (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.		

Table 4e. Non-use and option values		**rMCZ Reference Area Lundy**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will protect both the features and their option to benefit from the services in the future from the risk of future degradation. Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society 'Your Seas Your Voice' campaign expressed a desire to protect the area, with the most common reasons being because of the 'spectacular undersea plants and animals', including megafauna, 'spectacular scenery' and because 'the whole place is amazing'.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ Reference Area Lyme Bay

Site area (km^2): 0.29

Table 1. Conservation impacts				**rMCZ Reference Area Lyme Bay**
1a. Ecological description				
The northern boundary follows the mean high water mark from Seven Rock Point in the west to an area just to the west of Devonshire Head and extends across the intertidal habitats. The recommended Marine Conservation Zone is located within the boundary of the Lyme Bay and Torbay Bay candidate Special Area of Conservation. The site extends from the shoreline to depths of approximately 10 metres below chart datum. It includes a variety of Ecological Network Guidance-listed features (e.g. *Padina pavonica* and *Sabellaria alveolata* reefs). The site is located just off the Undercliffs at Lyme Regis, an area of historic coastal landslides (Lieberknecht and others, 2011).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
High energy infralittoral rock	0.18	-	Unfavourable Condition	Recover to Reference Condition
Subtidal mixed sediments	0.07	-	Unfavourable Condition	Recover to Reference Condition
Intertidal coarse sediment	0.04	-	Unfavourable Condition	Recover to Reference Condition
Habitats of Conservation Importance				
Sabellaria alveolata reefs	-	1	Unfavourable Condition	Recover to Reference Condition
Species of Conservation Importance				
Haliclystus auricula	-	1	Unfavourable Condition	Recover to Reference Condition
Padina pavonica	-	1	Unfavourable Condition	Recover to Reference Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ Reference Area Lyme Bay**
Source of costs of the rMCZ Increase in costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
There are 37 records of archaeological features within the rMCZ (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impacts made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known so no overall cost to the sector has been estimated. However, the additional cost in one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). If archaeologists respond to the prohibition of excavation by undertaking an alternative archaeological excavation in another locality, this could result in additional costs to the archaeologists. As it is not possible to predict when or how often this could occur, this is not costed in the Impact Assessment. The prohibition of excavation and therefore interpretation of archaeological evidence from the site will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ Reference Area Lyme Bay</th></tr>
<tr><td colspan="2">Source of costs of the rMCZ
Management scenario 1: Closure of entire rMCZ to all commercial fishing.</td></tr>
<tr><th>Baseline description of activity</th><th>Costs of impact of rMCZ on the sector</th></tr>
<tr><td colspan="2">Overview: The rMCZ is situated inside the 6nm (nautical mile) limit and as such is subject to a number of existing fisheries restrictions (see Annex E). The rMCZ predominantly covers the intertidal area and is therefore relatively inaccessible to fishing vessels. There is thought to be a low level of potting effort. There is negligible or no fishing with other gear types. Estimated total value of UK vessel landings from the rMCZ: £0.001m/yr.</td></tr>
<tr><td>UK Pots and traps: The rMCZ is close to heavily potted areas but effort within the rMCZ is thought to be low (Devon and Severn Inland Fisheries and Conservation Authority, pers. comm., 2011). Estimated value of UK pot and trap landings from the rMCZ: less than £0.001m/yr.</td><td>Scenario 1: Given the very low level of activity, no significant impacts are expected. Estimated annual value of UK pot and trap landings affected:
<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001</td></tr></table></td></tr>
<tr><th colspan="2">Total direct impact</th></tr>
<tr><td>Total direct impact on UK commercial fishing</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected:
<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001</td></tr><tr><td>GVA affected</td><td><0.001</td></tr></table></td></tr>
<tr><td>Impact on non-UK commercial fishing</td><td>None.</td></tr>
</table>

Table 2c. Flood and coastal erosion risk management (coastal defence)	**rMCZ Reference Area Lyme Bay**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
The 0 to 20 year Shoreline Management Plan policies advocate 'no active intervention' along most of the coastline around the rMCZ, and 'hold the line' around developed areas to the east of the rMCZ. The Lyme Regis Beach Management Plan and Lyme Regis Coast Protection Works are anticipated in the next 5 years and further schemes may come forward as a result of the 'hold the line' policy (Environment Agency, pers. comm., 2012).	As a result of the rMCZ, it is anticipated that additional costs will be incurred in assessing environmental impacts in support of future licence applications for Flood and Coastal Erosion Risk Management (FCERM) schemes. For each licence application these costs are expected to arise as a result of approximately 0.5 to 1 day of additional work, although there may be cases where further additional consultant time is needed (Environment Agency, pers. comm., 2012). It has not been possible to obtain information on the likely number of licence applications that will be made over the 20 year period of the IA or estimates of the potential increase in costs. It is anticipated that no additional mitigation of impacts will be required (Environment Agency, pers. comm., 2012).

Table 2d. National defence	**rMCZ Reference Area Lyme Bay**
Source of costs of the rMCZ	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include rMCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**

Table 2d. National defence	**rMCZ Reference Area Lyme Bay**
MOD is known to make use of the rMCZ for aerial, surface and water column activities and sea bed sampling. The rMCZ is in an MOD danger area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this rMCZ alone).

Table 2e. Recreation	**rMCZ Reference Area Lyme Bay**
Source of costs of the rMCZ ***Recreational angling management scenario:*** Closure of the rMCZ to recreational angling. ***Archaeological heritage management scenario:*** Closure of the rMCZ to fossil (or other man-made and natural item) collection.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Angling: There is not thought to be any regular angling activity within the rMCZ, although individuals may occasionally use the area (Devon and Severn Inland Fisheries and Conservation Authority, 2011).	Given that it is thought that anglers make infrequent use of the rMCZ area, there are not expected to be any significant impacts associated with the closure. It is anticipated that the few anglers who currently use the site will respond to the closure to angling by fishing at alternative locations in the vicinity.
Archaeological heritage: This is a popular site for fossil hunting, particularly around Seven Rock Point (the central intertidal area of the rMCZ) (Lyme Regis Museum, pers. comm., 2011). There are a number of organisations that conduct fossil tours in the area, including the area covered by the rMCZ,. It is estimated that thousands of local, national and international visitors come to the area for fossil hunting every year (Lyme Regis Museum, pers. comm., 2011). The geologist from the Lyme Regis Museum, who is one of a number of people who conduct fossil hunting trips, estimates that he will typically take between 1,000 and 1,5000 people per year. The rMCZ contains a number of fossils that are encased in rock and too large to be removed. However, some loose fossils do periodically wash up on the beach which visitors collect and	Thousands of people view fossils from within the rMCZ as part of fossil tours and fossil hunting activity that occurs over the wider Lyme Bay coastline (Lyme Regis Museum, pers. comm., 2011). The rMCZ covers a relatively small area of the sites that these people visit in the local area and people would still be able to view fossils found in the rMCZ, and remove fossils found outside the boundaries of the rMCZ. The rMCZ is not situated in one of the more favourable areas for collection and removal of loose fossils (Lyme Regis Museum, pers. comm., 2011). As such, closure of the site to fossil collection is not expected to impact significantly on the number of fossil-related visitors, or on the quality of their experience of visiting the area. However, if there was an effect on the numbers of visitors this would be likely to have negative effects on the local economy.

Table 2e. Recreation	**rMCZ Reference Area Lyme Bay**
take home with them (Lyme Regis Museum, pers. comm., 2011). The majority of the loose fossils seem to be found outside the rMCZ, towards the east of Lyme Regis (Lyme Regis Museum, pers. comm., 2011). Visitors support the local economy by using local businesses such as hotels, bed and breakfast accommodation, shops and restaurants as well as directly via the fossil tours (Lyme Regis Museum, 2011).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Reference Area Lyme Bay**
Recreation (beach access, walking, swimming); research and education.	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ Reference Area Lyme Bay**	
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Infralittoral rock is an important habitat for inshore commercial fisheries species, particularly crabs and lobsters, as are subtidal sediments (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition. A description of on-site fishing activity and the value derived from it is set out in Table 2b.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit fishing within the rMCZ, the costs of which are set out in Table 2b. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species, which may benefit commercial stocks. As the rMCZ is small, it is unclear whether it would have any impact on stocks of mobile commercial finfish species. Low-mobility and site-attached species populations, such as crabs and crawfish, may improve as a result of reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ. As no fishing will be permitted within the rMCZ, no on-site benefits will be realised. The potential effects described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ Reference Area Lyme Bay**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits to fish populations. It is unclear	Anticipated direction of change:

Table 4b. Recreation	**rMCZ Reference Area Lyme Bay**	
The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition (see Table 1b). A description of on-site angling activity is set out in Table 2e. It has not been possible to estimate the value of angling at the site.	whether any benefits to fish populations would arise as a result of reduced fishing mortality due to management of commercial fishing (see Table 4a). As angling will not be permitted within the rMCZ, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers. Such benefits may be insignificant.	⟺ Confidence: Low
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition. Wildlife watching, including rockpooling and bird watching, takes place from the coastal part of the rMCZ. It has not been possible to estimate the value of wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. An improvement in the condition of site features and any associated increase in abundance and diversity of species that are visible to wildlife watchers may improve the quality of wildlife watching at the site and therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	Anticipated direction of change: ⇧ Confidence: Low

Table 4c. Research and education	**rMCZ Reference Area Lyme Bay**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. Archaeological research is carried out in the area and may include the site of the rMCZ. The extent of environmental research that has been carried out in	As an rMCZ Reference Area, the site will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures**.** It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧

Table 4c. Research and education		**rMCZ Reference Area Lyme Bay**
the rMCZ is not known. It has not been possible to estimate the value derived from research activities associated with the rMCZ.		Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. The wider area is popular with archaeological visitors. Events based on coastal processes, geomorphology, environmental conservation and management are provided by wardens based at Lyme Regis (Jurassic Coast, 2008) and may include discussion of and/or visits to the area of the rMCZ. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events on the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services		**rMCZ Reference Area Lyme Bay**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Improved habitat condition and a reduction in anthropogenic pressures increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ Reference Area Lyme Bay**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will protect both the features and their option to benefit from the services in the future from the risk of future degradation. Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society 'Your Seas Your Voice' campaign expressed a desire to protect the area, with the most common reasons being the 'spectacular undersea plants, animals and features', because 'the whole place is amazing' and due to a personal connection with the site.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ Morte Platform

Site area (km^2): 22.45

Table 1. Conservation Impacts				**rMCZ: Morte Platform**
1a. Ecological Description				
The Morte Platform is an area of rocky outcrops with patches of sediment, situated approximately 5km off Baggy Point. The depth of the area ranges between 35 and 40 metres below chart datum. The recommended Marine Conservation Zone (rMCZ) intersects with an area of higher than average benthic species diversity (within the South-West context). The sea bed consists of an assemblage of coarse sediments, stones, sand ridges and mud troughs. The mix of biotopes represented here is rarely represented anywhere else in the UK A range of features are present including *Sabellaria spinulosa* reefs, sublittoral biogenic reef, polychaete-rich communities and tide-swept channels. The rugose and varied nature of the sea bed is thought to be responsible for the high benthic species and biotope diversity in the area. The rock outcrops have formed a very frequent, dense series of small scarps and troughs up to 2 metres high; the majority are <0.5 metres high. The rocks have been subject to ancient tectonic movement and the bedding exposed on the sea bed can be linear and sinuous, and disrupted by faults and folds. Sediment is commonly restricted to the troughs and can include gravel and sand. There are a few small isolated sand waves as well as occasional sand ribbons and sand patches. (Lieberknecht and others, 2011).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
High energy circalittoral rock	4.86	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy circalittoral rock	14.50	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	6.11	-	Favourable Condition	Maintained at Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ Morte Platform**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Wrecked vessels and aircraft are recorded in the site (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost in one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.

Table 2b. Commercial fisheries	**rMCZ Morte Platform**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fisheries gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment in order to reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.	
Management scenario 1: No additional management.	
Management scenario 2: Zoned closure of areas of circalittoral rock (high and moderate energy) in the rMCZ to bottom trawls and dredges.	
Management scenario 3: Closure of entire rMCZ to bottom trawls and dredges.	

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ Morte Platform</th></tr>
<tr><th>Baseline description of activity</th><th colspan="2">Costs of impact of rMCZ on the sector</th></tr>
<tr><td colspan="3">Overview: The rMCZ is wholly inside 6nm (nautical miles) and a number of commercial fisheries restrictions are already in existence (listed in Annex E). There is no non-UK activity in the rMCZ. There is a low level of UK bottom trawling in the rMCZ. Estimated total value of UK vessel landings from the rMCZ is £0.005m/yr.</td></tr>
<tr><td>UK Bottom trawls: The rMCZ sits within the key bottom trawling grounds of the North Devon fleet. However, activity within the rMCZ itself is low, possibly due to the presence of hard ground, and the frequency of tows that occur in it is significantly lower than for the surrounding area (North Devon Fisherman's Association, pers. comm., 2011).

Estimated value of UK bottom trawl landings from the rMCZ is £0.005m/yr.

The proposed Atlantic Array wind farm is expected to result in the exclusion of trawlers from the wind farm area due to risks to safety associated with trawling between turbines (North Devon Fisherman's Association, pers. comm., 2011). The wind farm is situated to the north east of the rMCZ. Displacement from this area may result in increased effort in Bideford Bay and in the rMCZ.</td><td colspan="2">Scenario 1: No impacts are anticipated under this scenario.

Scenario 2: As the areas of circalittoral rock cover the vast majority of the rMCZ, the impacts of closing only these to bottom trawling are expected to be broadly the same as those described for closing the entire site in Scenario 3.

Scenario 3: If the entire rMCZ is closed to bottom trawling, fishing effort is likely to be displaced west into the main area of Bideford Bay fishing ground. It is thought that this would not significantly affect fishers (North Devon Fisherman's Association, pers. comm., 2011).

If significant displacement occurs as a result of the proposed Atlantic Array wind farm development to the north of the rMCZ, then a higher level of landings may be affected by the rMCZ.

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:
<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td></tr>
<tr><td>Value of landings affected</td><td>0</td><td>0.004</td><td>0.005</td></tr>
</table>
</td></tr>
<tr><th colspan="3">Total direct impact</th></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td colspan="2">Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:
<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.004</td><td>0.005</td></tr>
</table>
</td></tr>
</table>

Table 2b. Commercial fisheries	**rMCZ Morte Platform**
	GVA affected: 0.000 | 0.002 | 0.002
Impact on non-UK commercial fisheries	None.

Table 2c. Renewable energy	**rMCZ Morte Platform**
Source of costs of the rMCZ	
Management scenario 1: Increase in costs of assessing environmental impacts for licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline).	
Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and increase in cable protection costs for power export cables and inter-array cables within the rMCZ (relative to the mitigation provided in the baseline).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Wind energy: The proposed development of the Round 3 Atlantic Array wind farm, which is at the pre-planning application stage, is to be situated to the north-east of the rMCZ. Once fully operational, the wind farm is planned to have a production capacity of between 1,000MW and 1,390MW (RWE npower renewable, 2012). The preferred cable route for the wind farm runs to the west of the rMCZ. Recent revisions to the plans for the Atlantic Array wind farm have removed the eastern part of hte cable corridor, so that it no longer passes through the rMCZ (RWE npower renewables, 2012). It is anticipated that construction will begin in 2016 and be completed by 2019 (RWE, pers. comm., 2011).	***Wind energy:*** The estimated cost to the wind energy developer of this rMCZ is expected to fall within the following range of scenarios: *£m (one-off cost)* | Scenario 1 | Scenario 2 Cost to the operator | 0.003 | 0.003 ***Scenario 1:*** As a result of the designation of the rMCZ, the licence application for the wind farm, including the cable, will need to consider the potential effects of the construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.003m (based on additional days of consultancy time at £700/day (RWE, pers. comm., 2011)) in 2013. ***Scenario 2:*** As it is not expected that a cable route through the rMCZ will be sought, no

	additional mitigation is expected. Therefore the costs under scenario are only for increase licensed application costs, as described under scenario 1.

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Morte Platform**
Commercial fisheries (pots and traps); research and education.	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ Morte Platform**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. Circalittoral rock is an important habitat for inshore commercial fisheries species, particularly crabs and lobsters, as are subtidal sediments (Fletcher and others, 2012). The	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No additional management (above that in the baseline situation) of fishing activities is expected. No change in feature condition or harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected.	Anticipated direction of change: ⟺

Table 4a. Fish and shellfish for human consumption		**rMCZ Morte Platform**
baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. There is a low level of bottom trawling, primarily with otter trawls, and a low level of potting in the rMCZ. Estimated value of landings is £0.005m/yr.	Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Confidence: Moderate

Table 4b. Recreation		**rMCZ Morte Platform**
Baseline	**Beneficial impact**	
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education		**rMCZ Morte Platform**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. Ecological survey work has been undertaken in the area overlapping the rMCZ through the North Devon Biosphere Reserve.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be	As the rMCZ is offshore and therefore relatively inaccessible, no benefits	Anticipated

Table 4c. Research and education		**rMCZ Morte Platform**
protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ Morte Platform**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore, the features are unlikely to contribute to providing natural hazard protection. It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ Morte Platform**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will protect both the features and their option to benefit from the services in the future from the risk of future degradation. Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society 'Your Seas Your Voice' campaign expressed a desire to protect the area and safeguard it against the threats posed by commercial trawling.	Anticipated direction of change:  Confidence: Moderate

rMCZ Mounts Bay

Site area (km^2): 11.2

Table 1. Conservation impacts **rMCZ Mounts Bay**

1a. Ecological description

Recommended Marine Conservation Zone Mounts Bay encompasses an area of relatively sheltered coast (compared to other parts of the Cornish coastline), encompassing the area around the iconic landmark of St Michael's Mount. The depth of the site ranges from the shoreline to approximately 17 metres below sea level. The rMCZ intersects with an area of higher than average benthic species diversity and has been highlighted as a nursery area and important sea trout foraging area. The area is also important for winter diving birds as well as, to a lesser extent, basking shark and cetaceans (Lieberknecht and others, 2011). The area is considered to be of potential national importance for great northern diver *Gavia immer* and black-throated diver *Gavia arctica* (RSPB, pers. comm., 2012).

The bay is predominantly sandy, with infralittoral and intertidal rocky outcrops that support algal communities. Circalittoral bedrock is characterised by sea anemones, especially the jewel anemone *Corynactis viridis.* Seagrass beds are present in more sheltered areas.

Stackhouse Cove is a semi-exposed rocky shore backed by low cliffs, which consists of a series of sloping irregular platforms dissected by deep gullies. Upper and mid-shore habitats are dominated by limpets and snails. Low shore habitats have a wide variety of algae; vertical walls within gullies have rich sponge and sea squirt communities. St Michael's Mount is a tidal island separated from the mainland by a paved causeway. Boulder shores on the north-western corner have exceptionally rich communities with a very high biomass. Large specimens of the red alga *Palmaria palmata* have been found in the site.

Single specimens of *Arctica islandica* and *Paludinella littorina* have been recorded in the site and there have been numerous sightings of both species of seahorse, especially the spiny seahorse, which is known to occupy the seagrass meadows in the region (Lieberknecht and others, 2011).

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				
High energy infralittoral rock	0.16	-	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	0.12	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	0.56	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.01	-	Favourable Condition	Maintained at Favourable Condition

Intertidal sand and muddy sand	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.04	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	0.01	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	10.32	-	Favourable Condition	Maintained at Favourable Condition
Habitats of Conservation Importance				
Seagrass beds	0.01	-	Favourable Condition	Maintained at Favourable Condition
Species of Conservation Importance				
Arctica islandica	-	2	Favourable condition	Maintained at favourable condition
Gobius cobitis	-	3	Favourable condition	Maintained at favourable condition
Haliclystus auricula	-	4	Favourable condition	Maintained at favourable condition
Lucernariopsis campanulata	-	1	Favourable condition	Maintained at favourable condition
Lucernariopsis cruxmelitensis	-	1	Favourable condition	Maintained at favourable condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ Mounts Bay**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Nine wrecks are located in the site. Several artefacts have been found in the site including 2 boilers from the 1947 wreck of a British battleship. Peat is	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The

Table 2a. Archaeological heritage	**rMCZ Mounts Bay**
also recorded in the site. English Heritage has indicated that this site is likely to be of interest for archaeological excavation in the future as it is relevant to its National Heritage Protection Plan (theme 3A1.2) (English Heritage, pers. comm., 2012).	likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost in one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011).

Table 2b. Flood and coastal erosion risk management (coastal defence)	**rMCZ Mounts Bay**
Source of costs of the rMCZ Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
The 0 to 20 year Shoreline Management Plan policies state 'hold the line' along much of the coastline of the rMCZ, and future complex managed realignment issues are expected. Schemes may come forward as a result of the hold the line policy (Environment Agency, pers. comm., 2012).	As a result of the rMCZ, it is anticipated that additional costs will be incurred in assessing environmental impacts in support of future licence applications for Flood and Coastal Erosion Risk Management (FCERM) schemes. For each licence application these costs are expected to arise as a result of approximately 0.5 to 1 day of additional work, although there may be cases where further additional consultant time is needed (Environment Agency, pers. comm., 2012). It has not been possible to obtain information on the likely number of licence applications that will be made over the 20 year period of the IA or estimates of the potential increase in costs. It is anticipated that no additional mitigation of impacts will be required (Environment Agency, pers. comm., 2012).

Table 2c. National defence	**rMCZ Mounts Bay**
Source of costs of the rMCZ	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities, including practice firing.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this rMCZ alone).

Table 2d. Ports, harbours, shipping and disposal sites	**rMCZ Mounts Bay**
Source of costs of the rMCZ	
Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications. This applies to disposal sites within 1km of the rMCZ. It is not anticipated that any additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ will be needed for activities relating to ports, harbours, shipping and disposal sites. ***Management scenario 2:*** Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to disposal sites and future licence applications for potential port and harbour developments within 5km of the rMCZ. Additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ may be needed for future harbour developments.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
<u>*Disposal sites:*</u> The Mounts Bay disposal site is situated approximately 0.3km south of the rMCZ. This is the only marine disposal site in the far south-west. It received an average of 7,500 wet tonnes of material from maintenance works per annum between 1999 and 2008 (Cefas, 2011). No licence applications have been made over the last 10 years to dispose of material at	***Scenario 1:*** Future licence applications for disposal of material at the Mounts Bay dredge disposal ground will need to consider the potential effects of disposal activity on the features protected by the rMCZ, and the rMCZ conservation objectives. No disposal at sea licence applications are anticipated over the timeframe of the IA and as such no costs are

Table 2d. Ports, harbours, shipping and disposal sites	**rMCZ Mounts Bay**
this site (Cefas, 2011). As such, it is assumed that no licence applications are likely to be made over the timeframe of the Impact Assessment (IA). *Harbour development:* St Michael's Mount harbour is adjacent to the rMCZ. Ports within 5km include Mousehole, Newlyn and Penzance.	expected. ***Scenario 2:*** As set out under scenario 1, no disposal at sea licence applications are anticipated over the timeframe of the IA and as such no costs are expected. For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at the national level in Annex N11). Sufficient information is not available to identify whether any additional mitigation, relative to the baseline, of impacts on features protected by the MCZ will be needed for such future port and harbour developments. Unknown potentially significant costs of mitigation could arise

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Mounts Bay**
Commercial fisheries (dredges, bottom trawls, pots & traps, nets, hooks & lines), recreation, water abstraction, discharge and diffuse pollution*.	

* The IA aassumes that no additional mitigation of the 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 Plan process (Natural England, pers. comm., 2010).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ Mounts Bay**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. Circalittoral rock is an important habitat for inshore commercial fisheries species (particularly crabs and lobsters), as are subtidal sediments (Fletcher and others, 2012). Seagrass beds within the rMCZ provide important nursery areas for flatfish (Joint Nature Conservation Committee, 2011) and, as such, the rMCZ is likely to help to support potential on-site and off-site fisheries. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. Fishing with nets and with hooks and lines occurs in the rMCZ. This includes set gillnets for species such as bass, ring netting for pilchards, and trolling for bass. There is also a low level of potting close inshore. Estimated value of landings is £0.028m/yr.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No additional management (above that in the baseline situation) of fishing activities is expected. No change in feature condition or harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ Mounts Bay**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. Angling occurs in Mounts Bay for species including whiting, haddock, mackerel, garfish, lesser spotted dogfish, red gurnard and blue shark. It has not been possible to estimate the value of angling at the site.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition or fishing mortality is anticipated and therefore no on-site or off-site benefits are expected (see Table 4a for further details). Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in angling visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK angling.	Anticipated direction of change: ⟺ Confidence: Moderate
Diving: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. Local companies provide beginner and advanced diving experiences at Mounts Bay for a variety of wreck and reef sites. It has not been possible to estimate the value of diving in the rMCZ.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition is anticipated and therefore no benefits to diving are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in dive visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK diving.	Anticipated direction of change: ⟺ Confidence: Moderate
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.	Anticipated direction of change: ⟺

Table 4b. Recreation		**rMCZ Mounts Bay**
when in favourable condition. Tourist companies offer boat trips around Mounts Bay to see the local wildlife, including dolphins, basking shark, sunfish and leatherback turtle. It has not been possible to estimate the value of wildlife watching in the rMCZ.	Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	Confidence: Moderate

Table 4c. Research and education		**rMCZ Mounts Bay**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. The extent of research activity currently conducted in and around the rMCZ is not known. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. The extent of education activity currently conducted in and around the rMCZ is not known. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events on the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence:

Table 4c. Research and education		**rMCZ Mounts Bay**
		Moderate

Table 4d. Regulating services		**rMCZ Mounts Bay**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Seagrass habitats are particularly efficient carbon sinks. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, in particular seagrass beds and intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ Mounts Bay**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will protect both the features and their option to benefit from the services in the future from the risk of future degradation. Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society 'Your Seas Your Voice' campaign expressed a desire to protect the area, including the megafauna, with a number of voters stating that the area 'means a great deal to me personally'.	Anticipated direction of change:  Confidence: Moderate

rMCZ Reference Area Mouth of The Yealm

Site area (km^2): 0.035

Table 1. Conservation impacts				**rMCZ Reference Area Mouth of The Yealm**
1a. Ecological description				
The site boundary follows the mean high water mark from the Tomb in the west to just east of Season Point and extends across the intertidal area. The site is located along a stretch of rocky coastline with patches of sand and coarse sediment, in between Wembury and the Yealm estuary. The mouth of the Yealm opens into Wembury Bay. Wave-sheltered bedrock occurrs at the entrance to the Yealm (Lieberknecht and others, 2011).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
High energy intertidal rock	< 0.01	-	Unfavourable Condition	Recover to Reference Condition
High energy infralittoral rock	0.02	-	Unfavourable Condition	Recover to Reference Condition
Intertidal coarse sediment	< 0.01	-	Unfavourable Condition	Recover to Reference Condition
Moderate energy intertidal rock	< 0.01	-	Unfavourable Condition	Recover to Reference Condition
Habitats of Conservation Importance				
Estuarine rocky habitats	< 0.01	-	Unfavourable Condition	Recover to Reference Condition
Seagrass beds	< 0.01	-	Unfavourable Condition	Recover to Reference Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Recreation	**rMCZ Reference Area Mouth of The Yealm**
Source of costs of the rMCZ Recreational angling management scenario: closure of rMCZ to recreational angling.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Angling: Anglers regularly fish from Season Point, which is covered by the eastern half of the rMCZ. Anglers also fish further to the west, just outside the rMCZ. Between 1 and 10 anglers typically use the rMCZ on a daily basis (Yealm Harbour Authority, pers. comm., 2011); this equates to between 365 and 3,650 angling trips per annum. Usually individual anglers, rather than club members, use the area. A wide variety of species are caught within the rMCZ including bass, mackerel, cod, ray (a large number were caught during summer 2011), ballan wrasse, rainbow wrasse (occasionally), pollack, grey mullet (occasionally) and dogfish, and plaice are caught on the sandbar (Yealm Harbour Authority, pers. comm., 2011).	The rMCZ is relatively small but it is a popular fishing spot. A number of individuals and a total of between 365 and 3,650 angling trips per year will be affected by the closure of the rMCZ. It is likely that anglers will respond by fishing around the boundary of the rMCZ or perhaps travelling slightly further afield to Wembury, which is to the west of the rMCZ (Yealm Harbour Authority, pers. comm., 2011). This may result in increased travel costs or a change in the frequency of angling trips made by affected individuals. There are concerns over safety if anglers were to fish around the boundary of the rMCZ, as it is very rocky and quite treacherous (Yealm Harbour Authority, 2011).

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Reference Area Mouth of The Yealm**
Recreation (diving, canoes/dinghies, beach access); research and education.	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ Reference Area Mouth of the Yealm**	
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Infralittoral rock is an important habitat for inshore commercial fisheries species (particularly crabs and lobsters) (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition. No known commercial fishing currently occurs in the rMCZ.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit fishing within the rMCZ, although no commercial fishing is thought to occur in the site. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. As the rMCZ is small, it is unclear whether it would have any impact on stocks of mobile commercial finfish species. Low-mobility and site-attached species populations, such as crabs and crawfish, may improve as a result of reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ. As no fishing will be permitted within the rMCZ, no on-site benefits will be realised. The potential effects described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ Reference Area Mouth of the Yealm**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition (see Table 1b). A description of on-site angling activity is set out in Table 2a. It has not been possible to estimate the value of angling at the site.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits to fish populations. It is unclear whether any benefits to fish populations would arise as a result of reduced fishing mortality due to management of commercial fishing (see Table 4a). As angling will not be permitted within the rMCZ, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers. Such benefits may be insignificant.	Anticipated direction of change: ⟺ Confidence: Low
Diving: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition. A low level of diving is thought to occur in the rMCZ. It has not been possible to estimate the value of diving at the site.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. An improvement in the condition of site features and any associated increase in abundance and diversity of species, which may include recovery of fragile and slow-growing species, may improve the quality of diving at the site and therefore the value of the ecosystem service. The designation may lead to an increase in dive visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK dive visits and/or a redistribution of location preferences.	Anticipated direction of change: ⇧ Confidence: Low
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition. There are various walks around the area where visitors can enjoy the local wildlife and bird watch. It has not been possible to estimate the value of wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. An improvement in the condition of site features and any associated increase in abundance and diversity of species that are visible to wildlife watchers may improve the quality of wildlife watching at the site and therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ Reference Area Mouth of the Yealm**	
	site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	

Table 4c. Research and education	**rMCZ Reference Area Mouth of The Yealm**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. Research activities are carried out in the estuary as part of its management, and a number of activities are set out in the estuary management plan (Yealm Estuary Mangement Group, 2007). The extent to which these activities and other research activities may focus on the area of the rMCZ is not known. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	As an rMCZ Reference Area, the site will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures. It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. There is environmental interpretation provided around the estuary. The estuary management plan sets out actions to improve interpretation and education activities (Yealm Estuary Mangement Group, 2007). It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events on the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services	**rMCZ Reference Area Mouth of The Yealm**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Seagrass habitats are particularly efficient carbon sinks (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rocky habitats in estuaries make a significant contribution to the overall diversity (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, particularly seagrass beds and intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Improved habitat condition and a reduction in anthropogenic pressures may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ Reference Area Mouth of The Yealm**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will protect both the features and their option to benefit from the services in the future from the risk of future degradation. Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society 'Your Seas Your Voice' campaign	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4e. Non-use and option values	**rMCZ Reference Area Mouth of The Yealm**	
	expressed a desire to protect the area, with the most common reasons being because of the 'spectacular' undersea plants, animals and biodiversity, because 'the whole place is amazing' as well as due to a personal connection with the site.	

rMCZ Newquay and The Gannel

Site area (km^2): 9.43

Table 1. Conservation impacts **rMCZ Newquay and The Gannel**

1a. Ecological description

The site boundary extends along the mean high water mark from Kelsey Head (west of Crantock Beach) to Trevelgue Head at Porth Beach. The site encompasses the Gannel estuary as far as the tidal limit near the A3075 road bridge. The seaward boundary extends in an arc around the coastline at a distance of 1km. The recommended Marine Conservation Zone intersects a mapped area of higher than average benthic species diversity and the estuary has an important ecological function as a nursery area.

The Gannel is a small estuary lying between the two exposed headlands of Pentire Point East and Pentire Point West near Newquay, and has a shallow inlet that has been rapidly silting up with sand in recent times. Water quality within the estuary has been classified as grade A. The largest area of subtidal habitat is at Vugga Cove at the mouth of the estuary, where the channel is at its deepest. Sheltered by the headlands is Crantock Beach, a broad, calcareous sandflat, which is backed by a small area of dunes. In the upper part of the estuary, there is an extensive area of saltmarsh. The Environment Agency has commented that a road development has led to a loss of coastal saltmarsh in the area.

The subtidal reefs off the Gannel are exposed and scoured. There are many surge gullies with communities of encrusting sponges and sea squirts below the kelp. The deeper reefs such as Pol Texas and Medusa Reef are dominated by short bryozoan and hydroid turf with small branching sponges and pink sea- fans on vertical surfaces.

Sediments, *Fucus vesiculosus, Nereis (Hediste) diversicolor* and *Scrobicularia plana* have been collected from the Gannel estuary; *Mytilus edulis*, *Mytilus galloprovincialis* and their hybrids have been collected from the mid-tidal zone at Newquay. There have been a number of sightings of short-snouted seahorses in the Newquay region (Lieberknecht and others, 2011). The area supports the largest breeding colony of kittiwake in south-west England, which has seen significant declines (RSPB, pers. comm., 2012).

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				
Coastal saltmarshes and saline reedbeds	0.02	-	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	0.03	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	0.01	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	1.41	-	Favourable Condition	Maintained at Favourable Condition

Intertidal sand and muddy sand	0.09	-	Favourable Condition	Maintained at Favourable Condition
Low energy intertidal rock	0.05	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	7.74	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mud	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Species of Conservation Importance				
Euincella verrucosa	-	1	Favourable Condition	Maintained at Favourable Condition
Gobius cobitis	-	1	Favourable Condition	Maintained at Favourable Condition
Ostrea edulis	-	2	Favourable Condition	Maintained at Favourable Condition
Paludinella littorina	-	1	Favourable Condition	Maintained at Favourable Condition
Anguilla Anguilla	-	-	To be determined	To be determined

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ Newquay and The Gannel**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
There are fish cellar sites at Newquay Bay. A World War II emergency battery can be found at Newquay. It is not clear if these are located in the site	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The

Table 2a. Archaeological heritage	**rMCZ Newquay and The Gannel**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
(English Heritage, pers. comm., 2012).	likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost in one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.

Table 2b. Flood and coastal erosion risk management (coastal defence)	**rMCZ Newquay and The Gannel**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
The 0 to 20 year Shoreline Management Plan policies along the coastline of the rMCZ are for 'hold the line' at Fistral and Newquay Bay in order to protect significant assets, with 'no active intervention' in other locations. Schemes may come forward as a result of the hold the line policy (Environment Agency, pers. comm., 2012).	As a result of the rMCZ, it is anticipated that additional costs will be incurred in assessing environmental impacts in support of future licence applications for Flood and Coastal Erosion Risk Management (FCERM) schemes. For each licence application these costs are expected to arise as a result of approximately 0.5 to 1 day of additional work, although there may be cases where further additional consultant time is needed (Environment Agency, pers. comm., 2012). It has not been possible to obtain information on the likely number of licence applications that will be made over the 20 year period of the IA or estimates of the potential increase in costs. It is anticipated that no additional mitigation of

Table 2b. Flood and coastal erosion risk management (coastal defence)	**rMCZ Newquay and The Gannel**
	impacts will be required (Environment Agency, pers. comm., 2012).

Table 2c. Ports, harbours, shipping and disposal sites	**rMCZ Newquay and The Gannel**
Source of costs of the rMCZ ***Management scenario 1:*** Increase in costs of assessing environmental impacts for future licence applications within 1km of the rMCZ. (Not relevant for this rMCZ). It is anticipated that no additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ will be needed for activities relating to ports, harbours, shipping and disposal sites. ***Management scenario 2:*** Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to unknown potential future port and harbour developments. Additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ may be needed for future harbour developments.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Harbour development: Newquay Harbour is situated adjacent to the rMCZ boundary. There are no known plans for developments at either harbour.	***Scenario 1:*** No costs are anticipated under scenario 1. ***Scenario 2:*** For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at the national level in Annex N11). Sufficient information is not available to identify whether any additional mitigation, relative to the baseline, of impacts on features protected by the MCZ will be needed for such future port and harbour developments. Unknown potentially significant costs of mitigation could arise

Table 2d. Renewable energy **rMCZ Newquay and The Gannel**

Source of costs of the rMCZ

Management scenario 1: Increase in costs of assessing environmental impacts for licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline).

Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and increase in cable protection costs for power export cables and inter-array cables (relative to the mitigation provided in the baseline).

Baseline description of activity

Wave energy: The rMCZ overlaps with the North Cornwall coastal wave energy Potential Development Area (PDA) (PMSS, 2010). Any potential installation could have a footprint within the PDA of 20km^2, covering 0.4% of the PDA (PMSS, 2010). The rMCZ covers 0.3% of the PDA. As the location of the potential energy generation installation is not known, the possible overlap of inter-array and export cables with the rMCZ is also not known. One energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015−2020 (Department of Energy and Climate Change [DECC], pers. comm., 2011). The development in the PDA is expected to have a production capacity of 520MW by 2030 (PMSS, 2010).

Costs of impact of rMCZ on the sector

The estimated cost to wave energy developers of this rMCZ is expected to fall within the following range of scenarios:

£m (one-off cost)	Scenario 1	Scenario 2
Cost to the operator	0.016	At least 0.016

Scenario 1: The analysis assumes that the potential future tidal energy installation is planned within, or within close proximity to, the rMCZ. As a result of the designation of the rMCZ, the potential licence application for the wave energy installation will need to consider the possible effects of the construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.016m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex N for details).

Scenario 2: In addition to the costs set out under scenario 1, further costs may occur under Scenario 2. The mitigation requires the use of alternative cable protection for export and inter-array cables that have not yet been consented. As the actual location of the potential installation is unknown, it is unclear whether any cables will be sought that pass through the rMCZ and, if they are, what length of cable may be affected. The cost of this mitigation measure is estimated to be £1m/km of cable (average of wind energy developers, see Annex H method paper for details) and as such the total mitigation cost could be significant.

The likelihood and magnitude of any additional costs cannot be calculated. However, JNCC and Natural England (pers. comm., 2012) state that the likelihood of this mitigation being

Table 2d. Renewable energy	**rMCZ Newquay and The Gannel**
	required is very low. Further details are provided in Annex H14. The impacts that are assessed in both scenarios are based on JNCC and Natural England's advice on the mitigation that could be required.

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Newquay and The Gannel**
Commercial fisheries (pots & traps, nets, hooks & lines, bottom trawls); recreation; research and education; water abstraction, discharge and diffuse pollution*.	

* The IA aassumes that no additional mitigation of the 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 Plan process (Natural England, pers. comm., 2010).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ Newquay and The Gannel**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No additional management (above	Anticipated direction of

Table 4a. Fish and shellfish for human consumption		**rMCZ Newquay and The Gannel**
delivery of fish and shellfish for human consumption. Circalittoral rock is an important habitat for inshore commercial fisheries species (particularly crabs and lobsters), as are subtidal sediments (Fletcher and others, 2012). The estuary is a nursery area for fish, including bass (Environment Agency, pers. comm., 2010) and, as such, is likely to help to support potential on-site and off-site fisheries. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. There is a low level of fishing within the rMCZ. Potting occurs, concentrated around the headlands, as do low levels of bass netting. There is very low effort using sand eel seines and bottom trawls. Estimated value of landings is £0.007m/yr.	that in the baseline situation) of fishing activities is expected. No change in feature condition or harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ Newquay and The Gannel**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. There are several favoured angling sites around Newquay, including rocky vantage points, where anglers can target bass, mackerel, pollack, flounder and mullet. Several companies offer boating trips for anglers. It has not been possible to estimate the value of angling at the site.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition or fishing mortality is anticipated and therefore no on-site or off-site benefits are expected (see Table 4a for further details). Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in angling visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK angling.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ Newquay and The Gannel**
Diving: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. There are several local dive companies that provide charter boats and offer beginner and advanced diving courses. It has not been possible to estimate the value of diving in the rMCZ.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition is anticipated and therefore no benefits to diving are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in dive visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK diving.	Anticipated direction of change: ⇔ Confidence: Moderate
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. Newquay has a variety of habitats that attract a wide range of species. Visitors can enjoy the Gannel estuary and its saltmarshes, which attract sea birds and wading birds. Attractions include Rushy Green, with its unusual flora, and Pentire Head, which is home to rich bird life. The cliffs around the harbour are home to wild flowers and herring gull can often be spotted by visitors. Coastal walks allow visitors to spot basking shark, seals and dolphins as well as other marine life.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4c. Research and education	**rMCZ Newquay and The Gannel**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. The extent of research activity currently conducted in and around the rMCZ is not known. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. The Wildlife Trust, RSPB and Newquay Zoo organise education events around the coast near Newquay. The Blue Reef Aquarium is based in Newquay and has links to Cornwall College, which offers a course in marine conservation. The extent of education activity currently conducted in and around the rMCZ is not known. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events on the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services	**rMCZ Newquay and The Gannel**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Coastal saltmarshes are known to be particularly efficient carbon sinks and cadmium is stored in sediment by cord grass *Spartina anglica,* which grows in intertidal mud. Marine sediments, through processes that occur in their upper layers, play an	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.	Anticipated direction of change: ⇔

Table 4d. Regulating services		**rMCZ Newquay and The Gannel**
important role in the global cycling of many elements, including carbon and nitrogen. Native oyster beds sequester carbon and filter algae and sediment from the water (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rocky habitats in estuaries make a significant contribution to the overall diversity, and infralittoral and circalittoral rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, in particular the coastal saltmarshes and intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ Newquay and The Gannel**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ North of Lundy (Atlantic Array Area)

Site area (km^2): 348.24

Table 1. Conservation Impacts				**rMCZ: North of Lundy (Atlantic Array area)**
1a. Ecological Description				
The sea bed within this recommended Marine Conservation Zone (rMCZ) consists of sand and coarse sediments, with some areas mapped as rock (although these may be areas of cobbles rather than solid bedrock). The area intersects with an area of higher than average benthic species diversity (within the South-West context). The depth of the site is between 35 and 55 metres below chart datum. (Lieberknecht and others, 2011). The area supports important foraging areas for sea birds. Including Manx shearwater *Puffinus puffinus*, razorbill *Alca torda*, guillemot *Uria aalge* and kittiwake (RSPB, pers. com., 2012).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
Moderate energy circalittoral rock	27.93	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	294.06	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	0.64	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	24.86	-	Favourable Condition	Maintained at Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ North of Lundy (Atlantic Array Area)**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
The remains of a 1940 wreck of an English collier have been found in the site (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost in one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.

Table 2b. Commercial fisheries	**rMCZ North of Lundy (Atlantic Array Area)**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fisheries gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment (IA) in order to reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.	
Management scenario 1: No additional management.	
Management scenario 2: Zoned closure of areas of moderate-energy circalittoral rock in the rMCZ to bottom trawls and dredges.	
Management scenario 3: Closure of entire rMCZ to bottom trawls and dredges.	

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ North of Lundy (Atlantic Array Area)</th></tr>
<tr><th>Baseline description of activity</th><th>Costs of impact of rMCZ on the sector</th></tr>
<tr><td colspan="2">Overview: The majority of the rMCZ lies between 6nm (nautical miles) and 12nm, with small proportions inside 6nm and outside of 12nm. Bottom trawling by UK and Belgian vessels occurs at significant levels within the rMCZ and there is also a moderate level of potting and a low level of dredging. French bottom trawlers are also active in this rMCZ. A number of commercial fisheries restrictions are already in existence (listed in Annex E), including the North Devon Ray Box. In addition, the rMCZ overlaps the Atlantic Array wind farm site, the development of which may lead to restrictions on fishing activity in the area. Estimated total value of UK vessel landings from the rMCZ is £0.159m/yr.</td></tr>
<tr><td>UK Dredges: There is a very low level of dredging within the rMCZ. The rMCZ does not cover an historic dredging ground and much of the area is considered unsuitable for working dredges. However, there has been an increase in dredging activity in the vicinity of the rMCZ in recent years and 2 scallop dredgers are now thought to fish within the site from North Devon ports as well as occasional visiting boats, in particular vessels from Wales (North Devon Fishermen's Association [NDFA], pers. comm., 2011). Estimated value of landings from the rMCZ is less than £0.001m/yr.

Welsh boats were poorly represented in the vessels sampled for the FisherMap survey, which provided the spatial distribution of fishing for under 15 metre vessels used for the IA. Given that Welsh scallopers operate in the area, the value of landings from dredging may be underestimated.</td><td>Scenario 1: No impacts are anticipated under this scenario.

Scenarios 2 and 3: The estimated value of landings affected is low and, as such, no significant impacts are expected. However it is noted that scallop dredging activity has been increasing in recent years, and the value of future landings may be higher than that estimated.

Estimated annual value of UK dredge landings affected is expected to fall within the following range:

<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td></tr>
<tr><td>Value of landings affected</td><td><0.001</td><td><0.001</td><td><0.001</td></tr>
</table>
</td></tr>
</table>

Table 2b. Commercial fisheries	**rMCZ North of Lundy (Atlantic Array Area)**
UK Bottom trawls: The area around the rMCZ is principally fished by North Devon otter trawlers, operating out of Appledore, Bideford and Ilfracombe, and to a lesser extent Clovelly. However visiting trawlers from elsewhere, including Wales and Cornwall, also fish in the area (South West Fishing Industry Group, 2011) (South West Fishing Industry Group, 2011). The majority of landings from the rMCZ are by under 15 metre vessels (MCZ Fisheries Model). The rMCZ covers a large area of bottom trawling ground, particularly bass and squid grounds as well as seasonal cuttlefish ground. Effort is more heavily concentrated in the western part of the rMCZ, including the area of moderate-energy circalittoral rock, but occurs throughout the rMCZ. There is a lower level of beam trawl activity in the rMCZ than otter trawl. Estimated value of bottom trawl landings from the rMCZ is £0.138m/yr. NDFA (pers. comm., 2012) considers this to be an underestimate and has estimated the total value of UK landings from the rMCZ at up to £1.2m/yr. The proposed Atlantic Array wind farm, if it goes ahead, is expected to result in the exclusion of trawlers from the wind farm area due to risks to safety associated with trawling between turbines. The wind farm area covers a proportion of the rMCZ and therefore any such restrictions would be expected to close part of the area of the rMCZ. Depending on the extent of the rMCZ closed due to the Atlantic Array development, as well as the redistributive effects of displacement on fishing effort, there may be a reduced level of bottom trawling affected by the rMCZ.	***Scenario 1:*** No impacts are anticipated under this scenario. ***Scenario 2:*** A similar pattern of impacts is expected as those described for Scenario 3, however their magnitude will be proportionately smaller as the management only applies to part of the rMCZ. ***Scenario 3:*** If the proposed Atlantic Array development does not go ahead and the entire site is closed to bottom trawling then the level of displacement, as highlighted by the value of landings from the rMCZ, is likely to be significant. Bottom trawling vessels from North Devon are likely to be displaced to remaining grounds to the south and west of the rMCZ. Visiting vessels may be displaced to these same areas, or may choose to reduce the time spent fishing in the wider area as a result of the rMCZ. Seasonal fisheries, including squid and cuttlefish, may be severely affected at times when the fish are predominantly found within the rMCZ. The value of landings affected is significant and the rMCZ may have impacts on the viability of the businesses of some North Devon fishers (South West Fishing Industry Group, 2011) (South West Fishing Industry Group, 2011). As the level of displacement is likely to be significant, it is expected that this may lead to gear conflict between displaced trawlers and static gear fishers off North Devon (SW Fishing Industry Group, 2011). The findings of monitoring of the impacts of the Lyme Bay Designated Area (Fishing Restrictions) Order 2008 (Mangi and others, 2011) suggest that this can occur in heavily fished areas. This may affect the value of landings by static gear or the cost of fishing for those outside the rMCZ. If the proposed Atlantic Array development goes ahead, at least part of the area covered by the rMCZ is likely be closed to bottom trawling to manage risks to safety arising from the turbines. In this situation, depending on the extent of the rMCZ closed due to the Atlantic Array development, as well as the redistributive effects of displacement on fishing effort, there may be a reduced level of bottom trawling affected by the rMCZ, resulting in a lower level of value of landings affected. Any such effect is not likely to occur until after the start of the construction of the wind farm, which is anticipated to start in 2016. Given the uncertainties over the likelihood of the Atlantic Array wind farm and the extent that it will affected bottom trawling within the rMCZ, the value of landigns excluding any adjustments

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ North of Lundy (Atlantic Array Area)</th></tr>
<tr><td></td><td>for the wind farm are taken forward as the potential costs of the rMCZ to the sector.

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.019</td><td>0.138</td></tr></table>
NDFA (pers. comm., 2012) considers the estimate of landings from the site (as set out in the baseline) and therefore used to show the impact of Scenario 3 (in the absence of the Atlantic Array development) to be an underestimate and has estimated the value of landings affected to be up to £1.2m/yr.</td></tr>
<tr><th colspan="2">Total direct impact</th></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following ranges:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.019</td><td>0.138</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.008</td><td>0.058</td></tr></table></td></tr>
<tr><td>Impact on non-UK commercial fisheries: Non-UK vessels using static gears, bottom trawls/dredges and mid-water trawls, and in particular Belgian bottom trawlers, fish within the rMCZ (Lee, 2010). Rising fuel costs have resulted in an increase in activity by French bottom trawlers in the wider south-west region, including this rMCZ (Bass Normandie, pers. comm., 2011).

Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: <£0.001m/yr; static gears: <£0.001m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for</td><td>Scenario 1: No impacts are anticipated under scenario 1.

Scenarios 2 and 3: If the proposed Atlantic Array development does not go ahead, non-UK vessels using bottom trawls/dredges, in particular Belgian bottom trawlers, will be affected if the rMCZ is closed to bottom trawling. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be: <£0.001m/yr (bottom trawls/dredges) and <£0.001m/yr (static gears). No information on the effect of the zoned closure to bottom trawls/dredges or the impact on Belgian vessel value of landings is available.

If the proposed Atlantic Array development goes ahead, at least part of the area covered by the rMCZ is likely be closed to bottom trawling to manage risks to safety arising from the</td></tr>
</table>

Table 2b. Commercial fisheries	**rMCZ North of Lundy (Atlantic Array Area)**
other countries. The proposed Atlantic Array wind farm, if it goes ahead, is expected to result in the exclusion of trawlers from the wind farm area due to risks to safety associated with trawling between turbines. The wind farm area covers a proportion of the rMCZ and therefore any such restrictions would be expected to close part of the area of the rMCZ. Depending on the extent of the rMCZ closed due to the Atlantic Array development, as well as the redistributive effects of displacement on fishing effort, there may be a reduced level of bottom trawling in the rMCZ compared to that set out in the baseline value of landings figures.	turbines. In this situation, depending on the extent of the rMCZ closed due to the Atlantic Array development, as well as the redistributive effects of displacement on fishing effort, there may be a reduced level of bottom trawling affected by the rMCZ, resulting in a lower level of value of landings affected. Any such effect is not likely to occur until after the start of the construction of the wind farm, which is anticipated to start in 2016. Given the uncertainties over the likelihood of the Atlantic Array wind farm and the extent that it will affected bottom trawling within the rMCZ, the value of landigns excluding any adjustments for the wind farm are taken forward as the potential costs of the rMCZ to the sector.

Table 2c. Renewable energy	**rMCZ North of Lundy (Atlantic Array Area)**
Source of costs of the rMCZ ***Management scenario 1:*** Increase in costs of assessing environmental impacts for licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). ***Management scenario 2:*** Increase in costs of assessing environmental impacts for licence applications and increase in cable protection costs for power export cables and inter-array cables (relative to the mitigation provided in the baseline).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Wind energy: The proposed development of the Round 3 Atlantic Array wind farm, which is at the pre-planning application stage, overlaps the full extent of the rMCZ. The proposed wind farm was originally expected to cover approximmatley 492km^2 , however this has now been reduced followed revisions to the plans RWE npower renewable, 2012). The developer now expects to apply for a license for between 188 and 278 turbines that, once fully operational, could	The estimated cost to the wind energy developer of this rMCZ is expected to fall within the following range of scenarios: *£m (one-off cost)* | Scenario 1 | Scenario 2 Cost to the operator | 0.006 | At least 0.006 ***Scenario 1:*** As a result of the designation of the rMCZ, the licence application for the wind farm will need to consider the potential effects of the construction and operational activities

Table 2c. Renewable energy	**rMCZ North of Lundy (Atlantic Array Area)**
have a production capacity of between 1,000MW and 1,390MW (RWE npower renewable, 2012). Originally it was anticipated that there would be 850km of inter-array cabling (RWE, pers. comm., 2011), however following the revised plans it assumed that this will reduce to approximately 565km (Finding Sacntuary calculation based on % reduction in maximum number of turbines). It is anticipated that construction will begin in 2016, with the wind farm becoming fully operational in 2019 (RWE, pers. comm., 2011).	on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.006m (based on additional days of consultancy time at £700/day (RWE, pers. comm., 2011)) in 2013. No additional mitigation measures are expected as a result of the rMCZ. ***Scenario 2:*** In addition to those costs set out under scenario 1, under scenario 2 further costs could arise as a result of mitigation requing alternative cable protection within the rMCZ. Approximately 565km of interarray cabling is anticipated within the rMCZ. JNCC and Natural England (pers. comm., 2012) state that the likelihood of this mitigation being required is very low, and if it were required it is only likely to be over a small proportion of the cabling. The cost of this mitigation measure is estimated to be £1m/km of cable (average taken from costs supplied by wind energy developers; see Annex H13 for details) and, as such, the total mitigation cost could be significant. However, as the likelihood of, and length over which, mitigation may be required is not known, it has not been possible to establish a likely cost. As such, the cost presented under scenario 2 may be an underestimate. ***Comments from the affected developer*** (RWE, pers. comm., 2011): The operator is concerned that further requirements may be placed upon it as a result of the rMCZ, including: • a requirement to undertake an additional 12 months of baseline monitoring and an associated 12-month delay in project revenue; • a pre-cut trenching technique being used rather than ploughing in areas of harder sea bed for inter-array cables; • additional cable installation techniques to be attempted before secondary protection accepted, i.e. jetting in softer sediment; and • micro-siting of jack-up barges and vessel anchoring areas. The operator estimates that such additional mitigation measures, if required, could impose costs of £177m over the IA 20 year time frame.

Table 2d. Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ North of Lundy (Atlantic Array area)**
Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and telecom cables are assessed in the Evidence Base, Annex H3 and Annex N3 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ North of Lundy (Atlantic Array area)**
Cables (existing interconnectors and telecom cables), commercial fisheries (nets, hooks and lines),	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ North of Lundy (Atlantic Array Area)**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore circalittoral rock and sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. New management of fishing activities may occur (above the baseline situation), the costs of which are set out in Table 2b, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks.	Anticipated direction of change: ⇧

Table 4a. Fish and shellfish for human consumption	**rMCZ North of Lundy (Atlantic Array Area)**	
provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. A description of on-site fishing activity and the value derived from it is set out in Table 2b.	The rMCZ is relatively large with a relatively high level of current fishing effort, and the potential reduction in fishing pressure may benefit commercial stocks of mobile and less mobile species. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits. The potential effects described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	Confidence: Low

Table 4b. Recreation	**rMCZ North of Lundy (Atlantic Array Area)**	
Baseline	**Beneficial impact**	
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education	**rMCZ North of Lundy (Atlantic Array Area)**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. Research activities have been and are being carried out across the rMCZ for the potential Atlantic Array wind farm. The research is primarily for the purposes of informing project design and the environmental impact assessment.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence:

Table 4c. Research and education	**rMCZ North of Lundy (Atlantic Array Area)**	
		High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services	**rMCZ North of Lundy (Atlantic Array Area)**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore, it is unlikely to contribute to providing natural hazard protection. It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives are achieved, the features of the site will be maintained in favourable condition. A potential reduction in anthropogenic pressures, including the use of bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ North of Lundy (Atlantic Array Area)**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change:  Confidence: Moderate

rMCZ North-East of Haig Fras

Site area (km^2): 463.72

Table 1. Conservation impacts				**rMCZ North-East of Haig Fras**
1a. Ecological description				
This site is located on a section of continental shelf. The depth ranges between 50 and 100 metres, with some sections dipping below the 100 metre depth contour. The sea bed is characterised by a range of sediments, including subtidal sand, subtidal coarse sediment, subtidal mixed sediment and subtidal mud. The south-eastern corner of the site is approximately 100km to the north-west of the Land's End peninsula (Lieberknecht and others, 2011).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
Subtidal coarse sediment	56.34	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	24.01	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mud	192.33	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	190.83	-	Favourable Condition	Maintained at Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Commercial fisheries	**rMCZ North-East of Haig Fras**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment which reflect this	

Table 2a. Commercial fisheries **rMCZ North-East of Haig Fras**

uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.

Management scenario 1: No additional management.

Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.

Management scenario 3: Closure of entire rMCZ to bottom trawls and dredges; closure of area of sub-tidal mixed sediment to pots and traps, nets, and hooks and lines.

Management scenario 4: Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, and hooks and lines.

Baseline description of activity	**Costs of impact of rMCZ on the sector**

Overview: The rMCZ is close to the south-western edge of the UK's 200nm (nautical mile) fishery limit and exclusive economic zone. Fishing effort is dominated by French otter trawlers, with lower levels of UK and Belgian beam trawling (Lee, 2010; South West Fishing Industry Group, 2011; MCZ Fisheries Model). Netting by UK vessels takes place throughout the rMCZ.

Estimated total value of UK vessel landings from the rMCZ: £0.034m/yr.

UK Bottom trawls: The rMCZ lies on the western side of an area of significant UK beam trawl activity (MCZ Fisheries Model). As the rMCZ is well offshore, only larger beam trawlers, typically of between 20 and 40 metres in length, tend to fish in the area (beam trawl skipper, pers. comm., 2011). Vessels active in the area principally target monkfish, sole and megrim (2011a). Estimated value of UK bottom trawl landings from the rMCZ: £0.020m/yr.

Scenario 1: No impacts are anticipated under Scenario 1.

Scenarios 2, 3 and 4: Under these scenarios, displaced vessels may increase their effort to the east of the rMCZ in the remaining area of the fishery.

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Value of landings affected	0.000	0.020	0.020	0.020

<table>
<tr><th colspan="2">Table 2a. Commercial fisheries</th><th>rMCZ North-East of Haig Fras</th></tr>
<tr><td colspan="2">UK Nets: A description of the baseline is not available for this rMCZ. Estimated value of UK net landings from the rMCZ: £0.013m/yr.</td><td>Scenarios 1 and 2: No impacts are anticipated under Scenarios 1 and 2.

Scenarios 3 and 4: A relatively low value of landings will be affected under these scenarios. No further information on the potential impacts was obtained.

Estimated annual value of UK net landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.001</td><td>0.013</td></tr></table>
In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with nets at current levels. Where this is the case, this activity was not the primary reason for assigning 'recover' conservation objective(s). As such, it is anticipated that, if management is required, it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears</td></tr>
<tr><th colspan="3">Total direct impact</th></tr>
<tr><td colspan="2">Total direct impact on UK commercial fishing</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected are expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.020</td><td>0.022</td><td>0.034</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.009</td><td>0.009</td><td>0.014</td></tr></table></td></tr>
<tr><td colspan="2">Impact on non-UK commercial fishing: Non-UK vessels using static gears, bottom trawls/dredges (in particular French otter trawlers, with lower levels of Belgian beam trawling) and mid-water trawls fish within the rMCZ (Lee, 2010).

Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.110m/yr; static gears: £0.000m/yr (Direction des Pêches</td><td>Scenario 1: No impacts are anticipated under Scenario 1.

Scenarios 2, 3 and 4: Non-UK vessels using bottom trawls/dredges, in particular French otter trawlers, and static gears will be affected by the rMCZ. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be: £0.110m/yr (bottom trawls/dredges). No information on the effect of the zoned closure to static gears or the impact on Belgian vessels is available.</td></tr>
</table>

Table 2a. Commercial fisheries	**rMCZ North-East of Haig Fras**
Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.	

Table 2b. National defence	**rMCZ North-East of Haig Fras**
Source of costs of the rMCZ	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for water column activities. The rMCZ is in an MOD danger and exercise area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this rMCZ alone).

Table 2c. Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ North-East of Haig Fras**
Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and telecom cables are assessed in the Evidence Base, Annex H3 and Annex N3 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ North-East of Haig Fras**
Cables (existing interconnectors and telecom cables); commercial fisheries (mid-water trawls)	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ North-East of Haig Fras**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable and unfavourable condition (see Table 1b). A description of on-site fishing activity and the value derived from it is set out in Table 2a.	If the conservation objectives of the features are achieved, subtidal mixed sediment and subtidal mud habitats will be recovered to favourable condition. Subtidal coarse sediment and subtidal sand habitats will be maintained in favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2a. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species, which may benefit commercial stocks. The rMCZ is relatively large with a relatively high level of current fishing effort, and the potential reduction in fishing pressure may benefit commercial	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ North-East of Haig Fras**
	stocks of mobile and less mobile species. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits. The potential effects described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	

Table 4b. Recreation		**rMCZ North-East of Haig Fras**
Baseline	**Beneficial impact**	
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education		**rMCZ North-East of Haig Fras**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out at the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High

Table 4c. Research and education	**rMCZ North-East of Haig Fras**	
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ North-East of Haig Fras**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore, it is unlikely to contribute to providing natural hazard protection. It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved, some of the features will be recovered to favourable condition. Others will be maintained in favourable condition. Improved habitat condition and a potential reduction in anthropogenic pressures, including the use of bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ North-East of Haig Fras**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ North-West of Jones Bank

Site area (km^2): 398.09

Table 1. Conservation impacts				**rMCZ North-West of Jones Bank**
1a. Ecological description				
The site comprises an area of continental shelf where the sea-floor habitat is dominated by subtidal mud. The eastern site boundary is approximately 165km west of Land's End. The depth of the site is between 100 and 200 metres. The area has been highlighted as a foraging ground for sea birds during the winter (Lieberknecht and others, 2011).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
Subtidal sand	5.90	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mud	388.45	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal coarse sediment	3.75	-	Unfavourable Condition	Recover to Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Commercial fisheries	**rMCZ North-West of Jones Bank**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment which reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.	
Management scenario 1: No additional management.	

<table>
<tr><th colspan="2">Table 2a. Commercial fisheries rMCZ North-West of Jones Bank</th></tr>
<tr><td colspan="2">Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.</td></tr>
<tr><th>Baseline description of activity</th><th>Costs of impact of rMCZ on the sector</th></tr>
<tr><td colspan="2">Overview: The rMCZ is close to the south-western edge of the UK's 200nm (nautical mile) fishery limit and exclusive economic zone. There is a low level of netting by UK vessels as well as significant activity by French otter trawlers in the rMCZ (MCZ Fisheries Model; Lee, 2010). The value of UK bottom trawl activity is very low, and there is currently no UK dredging activity (MCZ Fisheries Model).

Estimated total value of UK vessel landings from the rMCZ: £0.002m/yr.</td></tr>
<tr><td>UK Bottom trawls: The rMCZ lies to the east of a significant otter trawl ground. The rMCZ covers an area of mud habitat and is less suitable for trawling than the ground further west (Beam trawl skipper, pers. comm., 2011). The MCZ Fisheries Model indicates that there is a very low level of otter trawling within the rMCZ. There is no beam trawling in the rMCZ.

Estimated value of UK bottom trawl landings from the rMCZ: £0.001m/yr.</td><td>Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: Fishing activity in the rMCZ is low and no significant impacts to bottom trawlers are expected under this scenario.

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.001</td></tr></table></td></tr>
<tr><th colspan="2">Total direct impact</th></tr>
<tr><td>Total direct impact on UK commercial fishing</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected are expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.001</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.000</td></tr></table></td></tr>
<tr><td>Impact on non-UK commercial fishing: Non-UK vessels using static gears, bottom trawls/dredges (in particular French otter trawlers) and mid-water trawls fish within the rMCZ (Lee, 2010).</td><td>Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: Non-UK vessels using bottom trawls/dredges, in particular French otter trawlers, will be affected by the rMCZ. In the event of a full closure of the rMCZ, the</td></tr>
</table>

Table 2a. Commercial fisheries	**rMCZ North-West of Jones Bank**
Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.502m/yr; static gears: £0.000m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.	estimated value of the French landings affected will be £0.502m/yr (bottom trawls/dredges). No information on the effect on other countries' vessels' value of landings is available.

Table 2b. National defence	**rMCZ North-West of Jones Bank**
Source of costs of the rMCZ	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for water column activities. The rMCZ is in an MOD exercise area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this rMCZ alone).

Table 2c. Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ North-West of Jones Bank**
Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and telecom cables are assessed in the Evidence Base, Annex H3 and Annex N3 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ North-West of Jones Bank**
Cables (existing interconnectors and telecom cables); commercial fisheries (nets)	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ North-West of Jones Bank**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in unfavourable condition (see Table 1b). A description of on-site fishing activity and the value derived from it is set out in Table 2a.	If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2a. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species, which may benefit commercial stocks. The rMCZ is relatively large with a relatively high level of current fishing effort, and the potential reduction in fishing pressure may benefit commercial stocks of mobile and less mobile species. Potential benefits may arise on-	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption	**rMCZ North-West of Jones Bank**	
	site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits. The potential effects described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	

Table 4b. Recreation	**rMCZ North-West of Jones Bank**
Baseline	**Beneficial impact**
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A

Table 4c. Research and education	**rMCZ North-West of Jones Bank**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out at the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High

Table 4c. Research and education	**rMCZ North-West of Jones Bank**	
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ North-West of Jones Bank**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore, it is unlikely to contribute to providing natural hazard protection. It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. Improved habitat condition and a potential reduction in anthropogenic pressures, including from bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ North-West of Jones Bank**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ Otter Estuary

Site area (km^2): 0.11

Table 1. Conservation impacts **rMCZ Otter Estuary**

1a. Ecological description

The site lies wholly within the Otter Estuary Site of Special Scientific Interest, which is wider than the recommended Marine Conservation Zone as it includes the estuarine marshland above the mean high water mark. Flowing due south, the lower 2km reach of the River Otter is bounded by a sea embankment to the west and sandstone cliff (of up to 10 metres) to the east. The estuary broadens to a maximum width of 500 metres. Here the deep, fine alluvium has enabled a well-developed pan and creek system to form. A shingle barrier running eastwards from the west shore virtually closes the estuary from the sea, with the river entering through a 5 metre gap. Behind the barrier, the relatively extensive marsh constitutes a rich diversity of flora and fauna, and has a corresponding variety of bird species. The estuary is a nursery area for fish (including bass), with the supporting benthic habitats.

The River Otter has reaches which meander extensively, with varied associated in-stream habitats, including eroding bank faces and exposed riverine sediments. The exposed areas of sand and gravel deposited by river action are particularly valuable as habitats for invertebrates. There are several distinct communities of mud-dwelling invertebrates in the estuary. Characteristic species include the bivalve peppery furrow-shell *Scrobicularia plana*, the ragworm *Nereis diversicolor* and the crustacean *Corophium volutator*. This variety, together with adjacent habitats, provides food for a corresponding variety of bird species, some of which can be present in large numbers, principally curlew *Numenius arquata* and lapwing *Vanellus vanellus*. The area is an important additional feeding station for birds from the nearby Exe Estuary, especially during severe weather. The saltmarsh vegetation and tidal mudflats provide an important feeding and resting area for over-wintering birds (Lieberknecht and others, 2011).

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				
Coastal saltmarshes and saline reedbeds	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
High energy infralittoral rock	0.02	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	0.05	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Species of Conservation Importance				

Anguilla anguilla	-	-	To be determined	To be determined

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

None.

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)	**rMCZ Otter Estuary**
Flood and coastal erosion risk management (coastal defence); recreation; research and education; water abstraction, discharge and diffuse pollution*.	

* The IA aassumes that no additional mitigation of the 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 Plan process (Natural England, pers. comm., 2010).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ Otter Estuary**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the	If the conservation objectives of the features are achieved, the features will	Anticipated

Table 4a. Fish and shellfish for human consumption		**rMCZ Otter Estuary**
recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. The estuary is a nursery area for fish (Environment Agency, pers. comm., 2010) and, as such, is likely to help to support potential on-site and off-site fisheries. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. Currently, no commercial fishing is thought to take place in the estuary.	be maintained in favourable condition. No additional management (above that in the baseline situation) of fishing activities is expected. No change in feature condition or harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ Otter Estuary**
Baseline	**Beneficial impact**	
Angling: Angling is not known to take place in the recommended Marine Conservation Zone (rMCZ).	N/A	N/A
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. Recommended MCZ Otter Estuary is home to a large population of wintering wildfowl and waders, including redshank, common sandpiper, curlew and red-breasted merganser. Reed warbler, sedge warbler and reed bunting breed on the site. There are footpaths on either side of the estuary, two viewing platforms to the west and a bird hide to the east. It has not been possible to estimate the value of wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ Otter Estuary**
	overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	

Table 4c. Research and education		**rMCZ Otter Estuary**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. The extent of research activity currently conducted in and around the rMCZ is not known. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. Bird hides and interpretation boards are in place along the banks (primarily the western bank) of the estuary, which is part of the Otter Estuary Nature Reserve. Devon Wildlife Trust holds occasional open days at the reserve. The estuary and surrounding area is a popular visitor destination. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events on the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services		**rMCZ Otter Estuary**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Coastal saltmarshes are known to be particularly efficient carbon sinks and cadmium is stored in sediment by cord grass *Spartina anglica,* which grows in intertidal mud (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rocky habitats in estuaries make a significant contribution to the overall diversity (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, in particular the coastal saltmarshes and intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ Otter Estuary**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ Otter Estuary**
	the future, from past degradation and the risk of future degradation.	

rMCZ Padstow Bay and Surrounds

Site area (km^2): 91.87

Table 1. Conservation impacts **rMCZ Padstow Bay and Surrounds**

1a. Ecological description

The site extends around a stretch of coastline that is characterised by exposed cliffs and sandy wave-exposed bays, including the entrance to the Camel Estuary (beyond the Doom Bar). The site extends from the shoreline to approximately 50 metres of depth. Rocky habitat is present within the subtidal portion of the site. The recommended Marine Conservation Zone (rMCZ) intersects with an area of higher than average benthic species and habitat diversity (within the South-West context). Anecdotal evidence indicates that tide-swept biotopes, estuarine rocky habitats and blue mussel beds are also present in this area. The Pentire Peninsula Site of Special Scientific Interest is a coastal site, protecting sea bird colonies; the rMCZ boundary is an extension to this, covering a sea bird feeding and loafing area.

Most of the coast consists of a flat sand plain or gentle slope extending into shallow water with rock outcrops and broken reefs; most rock surfaces have a covering of sediment. Off the headlands, stable and often very broken bedrock extends into deeper water. Sand is important to the structure of sublittoral communities, except at headlands. Communities at The Bull near Trevose Head have been identified as distinctly different, with dense populations of *Mytilus edulis*, *Dendrodoa grossularia* and *Maia squinado*.

At Trevone there are extensive rocky shores which have been considered sites of primary marine biological importance; these are the most extensive rocky shores on the north Cornwall coast. Newtrain Bay, Trevone has a series of irregular rocky reefs that support rich littoral communities. Mid-shore habitats are mussel/barnacle/limpet-dominated and the limpet *Patella aspersa* (now *Patella ulyssiponensis*) is particularly abundant. An unusual feature of the site is a zone of the brown alga *Cystoseira tamariscifolia* at low water. A population of the Mediterranean hermit crab *Clibanarius erythropus* was present but has not been seen following the oil pollution from the *Torrey Canyon* in 1968.

Rocks surveyed in the Padstow area are dominated by algae to about 13 metres but kelp is restricted to shallow water (generally <3 metres). Circalittoral communities include several southern species but a low variety of species is generally present. Characteristic species include *Pentapora foliacea*, *Stolonica socialis*, *Alcyonidium gelatinosum*, *Eunicella verrucosa* and *Marthasterias glacialis* (Lieberknecht and others, 2011).

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				
High energy circalittoral rock	9.71	-	Favourable Condition	Maintained at Favourable Condition

Table 1. Conservation impacts				**rMCZ Padstow Bay and Surrounds**
High energy infralittoral rock	44.45	-	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	0.48	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	0.07	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	0.65	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.12	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy circalittoral rock	12.18	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy infralittoral rock	0.58	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.01	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	23.59	-	Favourable Condition	Maintained at Favourable Condition
Species of Conservation Importance				
Arctica islandica	-	1	Favourable Condition	Maintained at Favourable Condition
Eunicella verrucosa	-	21	Favourable Condition	Maintained at Favourable Condition
Haliclystus auricula	-	1	Favourable Condition	Maintained at Favourable Condition
Lucernariopsis cruxmelitensis	-	1	Favourable Condition	Maintained at Favourable Condition
Palinurus elephas	-	1	Unfavourable Condition	Recovered to Favourable Condition
Non-ENG Mobile Species				
Tursiops truncatus	-	-	Favourable Condition	Maintained at Favourable Condition
Fulmarus glacialis	-	-	Favourable Condition	Maintained at Favourable Condition
Fratercula arctica	-	-	Favourable Condition	Maintained at Favourable Condition
Alca torda	-	-	Favourable Condition	Maintained at Favourable Condition
Rissa tridactyla	-	-	Favourable Condition	Maintained at Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ Padstow Bay and Surrounds**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications. (It is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline.) Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Cliff castle at Winecove Point and inscribed stones are recorded in the area, although it is not clear if these are located in the site. There are records of other items of archaeological interestin the site. Peat is recorded here. English Heritage has indicated that this site is likely to be of interest for archaeological excavation in the future as it is relevant to its National Heritage Protection Plan (theme 3A1.2) (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost of one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.

Table 2b. Commercial fisheries	**rMCZ Padstow Bay and Surrounds**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment which reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range. ***Management scenario 1:*** No additional management. ***Management scenario 2:*** No removal of crawfish (*Palinurus elephas*) from the rMCZ.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**

Table 2b. Commercial fisheries **rMCZ Padstow Bay and Surrounds**

Overview: The rMCZ is located on the North Cornwall coast and a number of fishing restrictions already apply (see Annex E). There is a fishing fleet of over 20 vessels based at Padstow Harbour, nearly all of which are day-boat potters, although many operate multiple gear types, typically nets and pots (Cornwall SFC, 2010). The area of the rMCZ is worked primarily by potters from Newquay, Padstow and Port Isaac (Cornwall Inshore Fisheries and Conservation Authority (IFCA), pers. comm., 2010). The ground is generally too hard for bottom trawling and scalloping and there are better grounds to the west of the rMCZ, although some bottom trawling does occur in the site.

Estimated total value of UK vessel landings from the rMCZ: £0.079m/yr.

UK Pots and traps: Potters, primarily from Newquay, Padstow and Port Isaac, work throughout the rMCZ. Their vessels are typically day boats, and they may also fish with nets (Cornwall SFC, 2010). Potters typically target lobster, brown crab and spider crab.

Estimated value of UK pot and trap landings from the rMCZ: £0.030m/yr.

Potters do not target crawfish, but these are occasionally caught as bycatch (Finding Sanctuary Vulnerability Assessment, 2011). The high value fetched for crawfish means that, when caught, they can make an important contribution to a fisher's income (Potter, pers. comm., 2011). The value of crawfish landings by potters from the International Council for the Exploration of the Sea (ICES) Rectangles (30E4 and 30E5) that cover the rMCZ averages £0.002m/yr (MMO, 2011a). The rMCZ covers virtually all of the rocky ground within these ICES Rectangles, and it is therefore assumed that all crawfish caught from these rectangles are from within the rMCZ.

Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: Crawfish are not a target species of potters active within the rMCZ and the affected value of landings is low. Therefore no significant impacts are anticipated. It should be noted however that due to their high value, they can make up a significant proportion of a day's fishing income when they are caught.

Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2
Value of landings affected	0.000	0.002

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th colspan="2">rMCZ Padstow Bay and Surrounds</th></tr>
<tr><td colspan="2">UK Nets: Netters active in the rMCZ typically use small vessels under 10 metres in length (MMO, 2011a). Gill netting occurs throughout the rMCZ, and bass and ray are targeted behind the surf line (Finding Sanctuary Vulnerability Assessment, 2011).

Estimated value of UK net landings from the rMCZ: £0.033m/yr.

Netters do not target crawfish but they are occasionally caught as bycatch (Finding Sanctuary Vulnerability Assessment, 2011). The high value fetched for crawfish means that, when caught, they can make an important contribution to a fisher's income (Potter, pers. comm., 2011). Crawfish landings using nets from the ICES Rectangles (30E4 and 30E5) that cover the rMCZ average £0.001m/yr (MMO, 2011a). The rMCZ covers virtually all of the rocky ground within these ICES Rectangles, and it is therefore assumed that all crawfish caught from these rectangles are from within the rMCZ.</td><td colspan="2">Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: Crawfish are not a target species of netters active within the rMCZ and the affected value of landings is low. Therefore no significant impacts are anticipated. It should be noted however that due to their high value, they can make up a significant proportion of a day's fishing income when they are caught.

Estimated annual value of UK net landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.001</td></tr></table></td></tr>
<tr><th colspan="4">Total direct impact</th></tr>
<tr><td colspan="2">Total direct impact on UK commercial fishing</td><td colspan="2">Estimated annual value of UK vessel landings and gross value added (GVA) affected are expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.003</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.001</td></tr></table></td></tr>
<tr><td colspan="2">Impact on non-UK commercial fishing</td><td colspan="2">None.</td></tr>
</table>

Table 2c. Flood and coastal erosion risk management (coastal defence)	**rMCZ Padstow Bay and Surrounds**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications. (It is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline.)	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
The 0 to 20 year Shoreline Management Plan policies along the coastline of the rMCZ are predominantly for 'no active intervention', with some 'managed realignment' in order to allow further no active intervention. There are localised 'hold the line' policies at settlement frontages. Schemes may come forward as a result of the hold the line policy (Environment Agency, pers. comm., 2012).	As a result of the rMCZ, it is anticipated that additional costs will be incurred in assessing environmental impacts in support of future licence applications for Flood and Coastal Erosion Risk Management (FCERM) schemes. For each licence application these costs are expected to arise as a result of approximately 0.5 to 1 day of additional work, although there may be cases where further additional consultant time is needed (Environment Agency, pers. comm., 2012). It has not been possible to obtain information on the likely number of licence applications that will be made over the 20 year period of the IA or estimates of the potential increase in costs. It is anticipated that no additional mitigation of impacts will be required (Environment Agency, pers. comm., 2012).

Table 2d. Ports, harbours, shipping and disposal sites	**rMCZ Padstow Bay and Surrounds**
Source of costs of the rMCZ	
Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to disposal of dredge material only. Disposal of material at the Padstow Bay disposal site will only be permitted in the western half of the disposal site (which is outside the rMCZ). No further mitigation additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ will be needed for activities relating to ports, harbours, shipping and disposal sites.	
Management scenario 2: Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to navigational dredging, disposal of dredge material and future potential port developments. Additional costs incurred in updating existing Maintenance Dredging Protocols (MDPs) and implementing new MDPs for ports that do not currently have one in place. Disposal of material at the Padstow Bay disposal site will only be permitted in the western half of	

Table 2d. Ports, harbours, shipping and disposal sites	**rMCZ Padstow Bay and Surrounds**
the disposal site (which is outside the rMCZ). Further additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ may be needed for future harbour developments.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
<u>*Navigational Dredging:*</u> Padstow Harbour is located a few miles to the east of the rMCZ boundary in the Camel Estuary. Maintenance dredging is carried out by Padstow Harbour Commissioners in order to maintain navigable channels. The dredging occurs between 1km and 5km from the rMCZ. Dredged material is sold for use elsewhere where possible; however, some material does not have commercial value and is disposed of at the Padstow Bay disposal site (Padstow Harbour Commissioners, pers. comm., 2011). <u>*Disposal Sites:*</u> The Padstow Bay disposal site is situated approximately 2 miles off Rumps Point and straddles the boundary of the rMCZ. An average of 3,400 wet tonnes/yr was disposed of at the site between 1999 and 2008 (Cefas, 2011). The Padstow Harbour Commissioners hold a 3-year licence, which expires in 2013, to dispose of up to 9,999 tonnes/yr at the site (Padstow Harbour Commissioners, pers. comm., 2011). On average, they dispose of material at the site 35 times/yr (Padstow Harbour Commissioners, pers. comm., 2011). There are no other ports or harbours within 5km of the rMCZ. <u>*Harbour developments:*</u> Padstow Harbour is located a few km to the east of the rMCZ boundary in the Camel Estuary, whilst Port Isaac is located approximately 5km north-east of the rMCZ. There are no known plans for developments at either harbour.	***Scenario 1:*** <u>*Disposal sites:*</u> Future licence applications for disposing of material at the Padstow Bay disposal site will need to consider the potential effects of the dredging on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in additional costs averaging £0.004m/yr. It is assumed for the purposes of the Impact Assessment that potential effects on the features protected by the rMCZ caused by the use of the disposal site would be mitigated if dredged material was disposed of only in the western half of the disposal site, which is outside the rMCZ (Natural England, pers. comm., 2011). This will incur additional costs to the Padstow Harbour Commissioners as the disposal location will be further from shore. It is estimated that closure of the eastern part of the disposal site will add 15 minutes to the time taken per disposal trip, and based on the hourly cost of the disposal services, will result in an additional cost of £40 per trip (Padstow Harbour Commissioners, pers. comm., 2011). Therefore, it is expected that Padstow Harbour Commissioners will incur an additional cost of £1,400/yr (£40 additional cost/trip multiplied by 35 trips/yr) as a result of the rMCZ. Overall, the rMCZ is expected to result in additional costs averaging £0.005m/yr (made up of the additional assessment costs of £0.004m/yr and additional disposal costs of £0.001m/yr). It should be noted that there are no other marine disposal sites on the north coast of Cornwall. As such, in the event that closure of the Padstow Bay disposal site was required to mitigate impacts on features protected by the rMCZ, significantly higher costs would be likely to be incurred for future disposal of dredged material by Padstow Harbour Commissioners. ***Scenario 2:***

Table 2d. Ports, harbours, shipping and disposal sites	**rMCZ Padstow Bay and Surrounds**
	Disposal sites: Additional costs of £0.005m/yr are expected, as described under Scenario 1. *Navigational dredging:* In addition, under this scenario future licence applications for navigational dredging within 5km of the rMCZ will need to consider the potential effects of the disposed material on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in additional costs averaging £0.002m/yr. Additional costs may be incurred to implement a potential new Maintenance Dredging Protocol (MDP), which will consider the potential effects of dredging on features protected by the rMCZ. The anticipated additional cost of the MDP is estimated as a one-off cost of £0.008m. *Harbour developments:* For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at the national level in Annex N11). Sufficient information is not available to identify whether any additional mitigation, relative to the baseline, of impacts on features protected by the MCZ will be needed for such future port and harbour developments. Unknown potentially significant costs of mitigation could arise.

Table 2e. Renewable energy	**rMCZ Padstow Bay and Surrounds**
Source of costs of the rMCZ	
Management scenario 1: Increase in costs of assessing environmental impacts for licence applications. (It is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline.)	
Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and increase in cable protection costs for power export cables and inter-array cables (relative to the mitigation provided in the baseline).	

<table>
<tr><th colspan="2">Table 2e. Renewable energy rMCZ Padstow Bay and Surrounds</th></tr>
<tr><th>Baseline description of activity</th><th>Costs of impact of rMCZ on the sector</th></tr>
<tr><td>Wave energy: The rMCZ overlaps with the North Cornwall coastal wave energy Potential Development Area (PDA) (PMSS, 2010). Any potential installation could have a footprint within the PDA of 20km^2, covering 0.4% of the PDA (PMSS, 2010). The rMCZ covers 2.8% of the PDA. As the location of the potential installation is not known, the possible overlap of the electricity generating devices, inter-array and export cables with the rMCZ is not known. One energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015–20 (Department of Energy and Climate Change [DECC], pers. comm., 2011). The development in the PDA is expected to have a production capacity of 520MW by 2030 (PMSS, 2010).</td><td>Wave energy: The estimated cost to wave energy developers of this rMCZ is expected to fall within the following range of scenarios:
<table><tr><td>£m (one-off cost)</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Cost to the operator</td><td>0.016</td><td>At least 0.016</td></tr></table>Scenario 1: The analysis assumes that the potential future tidal energy installation is planned within, or within close proximity to, the rMCZ. As a result of the designation of the rMCZ, the potential licence application for the wave energy installation will need to consider the possible effects of construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.016m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex N for details).

Scenario 2: In addition to the costs set out under scenario 1, further costs may occur under Scenario 2. The mitigation requires the use of alternative cable protection for export and inter-array cables that have not yet been consented.. As the actual location of the potential installation is unknown, it is unclear whether any inter-array or export cables will be sought that pass through the rMCZ, and if they are what length of cable may be affected. The cost of this mitigation measure is estimated to be £1.000m/km of cable (average of wind energy developers; see Annex H14 for details) and, as such, the total mitigation cost could be significant.

The likelihood and magnitude of any additional costs cannot be calculated. However, JNCC and Natural England (pers. comm., 2012) state that the likelihood of this mitigation being required is very low. Further details are provided in Annex H14.

The impacts that are assessed in both scenarios are based on JNCC and Natural England's advice on the mitigation that could be required.</td></tr>
</table>

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Padstow Bay and Surrounds**
Commercial fisheries (dredges, bottom trawls, and hooks and lines); recreation; research and education; water abstraction, discharge and diffuse pollution*	

* The IA aassumes that no additional mitigation of the 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 Plan process (Natural England, pers. comm., 2010).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ Padstow Bay and Surrounds**	
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. Rock habitats are important for inshore commercial fisheries species (particularly crabs and lobsters), as are subtidal sediments (Fletcher and others, 2012). Crawfish *Palinurus elephas* is a commercially targeted species. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish, for which provision is commensurate to that when in unfavourable condition.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of crawfish from the rMCZ. No change in feature condition or general harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Landings of crawfish from the rMCZ may be prohibited and this may allow local crawfish populations to improve. Any spill-over of crawfish from the rMCZ may benefit fishers in the local area.	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption	**rMCZ Padstow Bay and Surrounds**	
Commercial fishing in the rMCZ is primarily carried out using pots and traps, and nets. The area is principally worked by potters from Newquay, Padstow and Port Isaac targeting lobsters, brown crab and spider crab. Netters primarily target bass and rays. Estimated value of landings is £0.079m/yr.	Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	

Table 4b. Recreation		**rMCZ Padstow Bay and Surrounds**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and for recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition. Padstow is a popular spot for angling. The main species are carp, tench, bream, roach, rudd and perch. Local companies provide boat trips for anglers. It has not been possible to estimate the value of angling in the rMCZ.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of crawfish from the rMCZ. No change in feature condition or general harvesting of fish and shellfish (with the exception of crawfish, which is not typically targeted by anglers) is anticipated and therefore no on-site or off-site benefits are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⟺ Confidence: Moderate
Diving: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition (with the exception of crawfish, which are not typically a focus for divers). No change in on-site feature condition is anticipated and therefore no benefits to diving are expected. Designating the rMCZ will protect its features and the ecosystem services	Anticipated direction of change: ⟺ Confidence:

Table 4b. Recreation	**rMCZ Padstow Bay and Surrounds**	
Local companies provide SCUBA diving training and guided dives in Padstow. It has not been possible to estimate the value of diving in the rMCZ.	that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in dive visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK dive visits and/or a redistribution of location preferences.	Moderate
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition. Boat trips are available from Padstow harbour for visitors to experience the local wildlife, including grey seal, dolphins, porpoises, basking shark and sunfish. It has not been possible to estimate the value of wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition (with the exception of crawfish, which are not typically a focus for wildlife watching). No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4c. Research and education	**rMCZ Padstow Bay and Surrounds**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. The extent of research activity currently conducted in and around the rMCZ is	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧

Table 4c. Research and education		**rMCZ Padstow Bay and Surrounds**
not known. It has not been possible to estimate the value derived from research activities associated with the rMCZ.		Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. The Polzeath Marine Visitor Centre received 1,355 visitors in 2008 (Cornwall Council, date unknown). The centre is open during the summer and, in partnership with Cornwall Wildlife Trust and the National Trust, holds a variety of education events focusing on the marine and coastal environment. The coastline of the rMCZ receives high numbers of visitors. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events on the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services		**rMCZ Padstow Bay and Surrounds**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, in particular the intertidal	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition, with the exception of crawfish, which will be recovered to favourable condition. No change in feature condition and management of human activities, with the exception of crawfish, is expected and therefore no significant benefit to the regulation of pollution is expected. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4d. Regulating services		**rMCZ Padstow Bay and Surrounds**
habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	necessary, mitigation would be introduced, with the associated costs and benefits).	

Table 4e. Non-use and option values		**rMCZ Padstow Bay and Surrounds**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation. Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society 'Your Seas Your Voice' campaign expressed a desire to protect the area because of the amazing nature of the place, and because they had a personal connection with the area. Other important factors were the spectacular plants and animals of the site, its spectacular overall biodiversity and scenery.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ Poole Rocks

Site area (km^2): 3.7

Table 1. Conservation impacts				**rMCZ Poole Rocks**
1a. Ecological description				
Poole Rocks is an area of rocky outcrops, at depths of between 6 and 11 metres, within the sediment-dominated Poole Bay. The outcrops have been described as clumps of fossilised trees, which support local lobster populations, and are popular with divers and sport anglers. The recommended Marine Conservation Zone (rMCZ) is situated in an area classified as having a 'medium' level of biotope diversity that is within the top 25% of areas in the UK for species and biotope richness, as well as relatively high bird densities. The rMCZ is within a Sensitive Marine Area in recognition of its important subtidal habitats, but it does not directly overlap or adjoin any other existing protected area (Lieberknecht and others, 2011).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
Subtidal sand	2.73	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	1.01	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy circalittoral rock	-	-	Favourable Condition	Maintained at Favourable Condition
Species of Conservation Importance				
Gobius couchii	-	1	Favourable Condition	Maintained at Favourable Condition
Ostrea edulis	-	6	Favourable Condition	Maintained at Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Ports, harbours, shipping and disposal sites	**rMCZ Poole Rocks**
Source of costs of the rMCZ	
Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to navigational dredging and disposal of dredge material only. It is not anticipated that any additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ will be needed for activities relating to ports, harbours, shipping and disposal sites. .	
Management scenario 2: Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to navigational dredging, disposal sites and future licence applications for potential port and harbour developments within 5km of the rMCZ. Additional costs incurred in updating existing Maintenance Dredging Protocols (MDPs). Additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ may be needed for future port and harbour developments.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
<u>*Navigational Dredging:*</u> There is a maintained dredged channel (the Swash Channel) extending out from the entrance to Poole Harbour in a south-easterly direction that allows access to the harbour by larger vessels. The channel is maintained by Poole Harbour Commissioners as part of their statutory duties. The channel is more than 1km but less than 5km from the rMCZ. No other ports, harbours or dredging activities are within 5km of the rMCZ. <u>*Disposal Sites:*</u> No disposal sites are situated within 1km of the rMCZ. Disposal-at-sea activities occur within 5km of the rMCZ at Bournemouth Beach (beach recharge), Brownsea (experimental site) disposal site, Poole Bay disposal site and Swanage Bay disposal site. For the purposes of the Impact Assessment (IA), it is assumed that an average of 4.9 applications (equivalent to the average number/yr between 2001 and 2010 [Cefas, 2011]) for licences to dispose of material at the disposal sites will be made in each year over the timeframe of the IA. <u>*Harbour development*</u>: The entrance to Poole Harbour is situated within 5km of the rMCZ, although most of the infastruture in the habour is more than 5km from the rMCZ. There are no known plans for developments.	***Scenario 1:*** No impacts are anticipated under this scenario. ***Scenario 2:*** <u>*Navigational dredging:*</u> Poole Harbour Commissioners operate under the marine dredging protocol (MDP) and it is expected that their MDP baseline document will need to be updated to include consideration of the effects of their dredging on features protected by the rMCZ and the potential to achieve the rMCZ conservation objectives. This is expected to result in an additional cost of approximately £0.007m from 2013 (see Annex N for details), recurring every 3 years (Natural England, pers. comm., 2011). <u>*Disposal sites:*</u> Future licence applications for disposing of material at sea within 5km of the rMCZ will need to consider the potential effects of the disposed material on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in additional costs averaging £0.033m/yr. <u>*Harbour development*</u>: For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at

Table 2a. Ports, harbours, shipping and disposal sites	**rMCZ Poole Rocks**
	the national level in Annex N11). Sufficient information is not available to identify whether any additional mitigation, relative to the baseline, of impacts on features protected by the MCZ will be needed for such future port and harbour developments. Unknown potentially significant costs of mitigation could arise.

Table 2b. National defence	**rMCZ Poole Rocks**
Source of costs of the rMCZ	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities. The rMCZ is in an MOD exercise area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this rMCZ alone).

Table 2c. Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ Poole Rocks**
Oil and gas related activities (including carbon capture and storage): This rMCZ overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 26th or 27th Seaward Licensing Rounds). However, the area is not necessarily viable to develop. Impacts of rMCZs on the oil and gas related activities are assessed in the Evidence Base, Annex H10 and Annex N9 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Poole Rocks**
Commercial fisheries: dredges, bottom trawls, and hooks and lines; oil and gas (existing activity); recreation; water pollution from activities on land	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ Poole Rocks**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. Rock habitats are important for inshore commercial fisheries species (particularly crabs and lobsters), as are subtidal sediments (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. Potting occurs throughout the rMCZ, cuttlefish are targeted seasonally and there is also a low level of seasonal netting. Oyster dredging occurs in and around the rMCZ. Estimated value of landings is £0.060m/yr.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No additional management (above that in the baseline situation) of fishing activities is expected. No change in feature condition or harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ Poole Rocks**
Baseline	**Beneficial impact**	
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education		**rMCZ Poole Rocks**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out at the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is approximately 1 nautical mile from shore, it is unlikely that significant benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ Poole Rocks**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen. Native oyster beds sequester carbon and filter algae and sediment from the water (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ Poole Rocks**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem	Anticipated direction of change: ⇧ Confidence:

Table 4e. Non-use and option values		**rMCZ Poole Rocks**
	services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Moderate

rMCZ Skerries Bank and Surrounds

Site area (km^2): 249.69

Table 1. Conservation impacts — **rMCZ Skerries Bank and Surrounds**

1a. Ecological description

The landward boundary of the recommended Marine Conservation Zone (rMCZ) runs along the high water mark from Leek Cove around Prawle Point and Start Point to Torcross and comprises a rocky coast open to the full force of prevailing winds and waves. Skerries Bank is a 7km-long series of submerged sand and gravel habitat banks. The site extends from the coastline to depths of approximately 70 metres.

The rMCZ intersects with an area of higher than average benthic species diversity and higher than average pelagic interest. Local group feedback indicates that the area is also an important breeding area for flatfish as well as for mobile species. The rMCZ overlaps with the Start Point to Plymouth Sound and Eddystone candidate Special Area of Conservation (SAC), and with the Prawle Point to Start Point draft SAC. Two Sites of Special Scientific Interest are located along the shoreline adjacent to this rMCZ.

Exposed rocky shores have been described as dominated by barnacles with rich sublittoral fringe communities characterised by *Fucus serratus* and *Laminaria digitata*, with dense kelp forest characterising infralittoral habitats at many sites. Epiphytic red algae grew in profusion on the kelp stipes and the adjacent bedrock. Species recorded include *Delesseria sanguinea*, *Dilsea carnosa*, *Plumaria elegans* and the tufted coralline alga *Corallina officinalis*. The fauna are characteristic of wave-exposed conditions and include the sponges *Pachymatisma johnstonia* and *Clathrina coriacea*, and the sea squirt *Distomus variolosus*.

Boreal offshore muddy-sand, characterised by bivalve and gastropod molluscs, burrowing crustaceans (e.g. *Callianassa subterranea*), brittlestars, heart urchin *Echinocardium cordatum* and sea cucumbers, and boreal offshore mud associations, characterised by the burrowing echiuran *Maxmuelleria lankesteri,* have been found in Start Bay.

The reef areas of Lyme Bay, which comprises rock and mixed ground, extend from Portland Bill to central Lyme Bay and off Start Point. Their species which are listed for conservation are *Axinella dissimilis***,** Ross coral *Pentapora fascialis***,** dead man's fingers *Alcyonium digitatum***,** pink sea-fan *Eunicella verrucosa* and sunset cup coral *Leptopsammia pruvoti*.

Start Bay has a series of shingle banks and sandy coves leading to the rocky headland of Start Point. The exposed sloping shores are dominated by limpets and barnacles with sparse mussels and algae with well-developed lichen communities on the upper shore and in the splash zones. Slapton Sands is exposed to a low-to-medium energy wave climate and is the largest of 4 gravel barriers in Start Bay, the others being Hallsands, Beesands and Blackpool Sands. At high tide, these gravel barriers represent separate environments but, except for Blackpool Sands, they are connected during spring low tide (Lieberknecht and others, 2011).

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ

Broad-scale Habitats				
High energy infralittoral rock	1.27	-	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	0.30	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	0.08	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.20	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	0.03	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.04	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy circalittoral rock	101.79	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy infralittoral rock	4.41	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.02	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	12.50	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mud	4.06	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	41.55	-	Favourable condition	Maintained at favourable condition
Habitats of Conservation Importance				
Intertidal under boulder communities	-	1	Favourable Condition	Maintained at Favourable Condition
Species of Conservation Importance				
Euincella verrucosa	-	1	Favourable Condition	Maintained at Favourable Condition
Hippocampus hippocampus	-	1	Favourable Condition	Maintained at Favourable Condition
Palinurus elephas	-	2	Unfavourable Condition	Recover to Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ Skerries Bank and Surrounds**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications. (It is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline.) Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Two historic shipwreck sites designated under the Protection of Wrecks Act 1973 are located within the rMCZ: Moor Sands and Salcombe Cannon. Since 2003, between one and two licences have been granted to survey the wrecks each year apart from in 2010. Similarly, since 2003, between one and two surface recovery licences have been granted each year, as well as one excavation licence in 2003. Further wrecks are recorded within and around the site. Peat is recorded in the site. English Heritage has indicated that this site is likely to be of interest for archaeological excavation in the future as it is relevant to its National Heritage Protection Plan (theme 3A1.2). (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost of one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.

Table 2b. Commercial fisheries	**rMCZ Skerries Bank and Surrounds**
Source of costs of the rMCZ	
Management scenario 1 (Finding Sanctuary Steering Group management recommendation): No additional management – continuation of the existing South Devon Inshore Potting Agreement (IPA) management regime.	
No additional management scenarios have been considered for this rMCZ as the rMCZ was put forward by the Finding Sanctuary Steering Group on the condition that the existing management arrangements remain unchanged.	

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ Skerries Bank and Surrounds</th></tr>
<tr><th>Baseline description of activity</th><th>Costs of impact of rMCZ on the sector</th></tr>
<tr><td colspan="2">Overview: The rMCZ is largely inside the 6nm (nautical mile) limit. Because of restrictions on trawling, fishing inside the rMCZ is dominated by static gear with the site heavily fished year round. The site is particularly valuable for potters, with brown crab and lobster the key target species. The rMCZ sits wholly within the area of the South Devon Inshore Potting Agreement (IPA), which manages fishing via licence variations. The rMCZ overlaps with three of the IPA's seasonal trawl corridors which permit trawling at certain times of the year (Devon and Severn IFCA, 2011). The majority of the rMCZ overlaps with areas where dredging and trawling are currently restricted year-round under the IPA. The ports of Kingsbridge, Salcombe and Beesands are all close to the rMCZ with around 45 resident vessels (MMO, 2010a), many of which are reliant on fishing inside the rMCZ (MMO, 2011a).

Estimated total value of UK vessel landings from the rMCZ: £1.216m/yr.

The north-west corner of the rMCZ overlaps with the Start Point to Plymouth Sound & Eddystone Special Area of Conservation (SAC), which is an area that is already permanently closed to trawling and dredging under the IPA. It is not yet known whether management of the SAC will affect the static gear fishing activity in this part of the rMCZ.</td></tr>
<tr><th colspan="2">Total direct impact</th></tr>
<tr><td>Total direct impact on UK commercial fishing</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected:

<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.000</td></tr><tr><td>GVA affected</td><td>0.000</td></tr></table>
As the rMCZ management scenario results in no changes to the existing fisheries management, including access arrangements for trawlers and dredgers, no impacts are expected. However, concerns have been raised by fisheries stakeholders that the designation of an MCZ over part of the IPA may lead to renegotiations by fishers of the boundaries for the IPA and of the seasonal periods in which dredging and trawling are restricted, using the rMCZ as a reason. Any renegotiations could increase or decrease access to different gear types and thereby impact on the landings of fishers in the area.</td></tr>
<tr><td>Impact on non-UK commercial fishing</td><td>None.</td></tr>
</table>

Table 2c. Ports, harbours, shipping and disposal sites	**rMCZ Skerries Bank and Surrounds**
Source of costs of the rMCZ	
Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. (Not relevant for this rMCZ). It is anticipated that no additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ will be needed for activities relating to ports, harbours, shipping and disposal sites.	
Management scenario 2: Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to disposal of dredge material and future potential port developments. Additional mitigation of impacts on features protected by the rMCZ may be needed for port developments, relative to the baseline.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Disposal Sites: Disposal of material takes place at the Bolt Head disposal site. The disposal site is between 1km and 5km to the west of the rMCZ. For the purposes of the Impact Assessment (IA), it is assumed that an average of 0.1 applications (equivalent to the average number/yr between 2001 and 2010 [Cefas, 2011])) for licences to dispose of material at the Bolt Head disposal site will be made in each year over the timeframe of the IA. *Harbour development:* The harbours of Beesands and Salcombe are within 5km of the rMCZ. There are no known plans for development at either harbour.	***Scenario 1:*** No costs are anticipated under Scenario 1. ***Scenario 2:*** *Disposal sites:* Future licence applications for disposing of material at sea within 5km of the rMCZ will be required to consider the potential effects of the disposed material on the features protected by the rMCZ and their conservation objectives. This is expected to result in additional costs averaging £0.001m/yr. *Harbour development:* For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at the national level in Annex N11). Sufficient information is not available to identify whether any additional mitigation, relative to the baseline, of impacts on features protected by the MCZ will be needed for such future port and harbour developments. Unknown potentially significant costs of mitigation could arise.

Table 2d. Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ Skerries Bank and Surrounds**
Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and telecom cables are assessed in the Evidence Base, Annex H3 and Annex N3 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Skerries Bank and Surrounds**
Cables (existing interconnectors and telecom cables); commercial fisheries (dredges, bottom trawls, pots and traps, nets, and hooks and lines); recreation; research and education; water abstraction, discharge and diffuse pollution*.	

* The IA aassumes that no additional mitigation of the 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 Plan process (Natural England, pers. comm., 2010).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ Skerries Bank and Surrounds**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. Rock habitats are important for inshore commercial fisheries species (particularly crabs and	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of	Anticipated direction of change:

Table 4a. Fish and shellfish for human consumption		**rMCZ Skerries Bank and Surrounds**
lobsters), as are subtidal sediments (Fletcher and others, 2012). Crawfish *Palinurus elephas* is a commercially targeted species. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition. A description of on-site fishing activity and the value derived from it is set out in Table 2b.	crawfish from the rMCZ. No change in feature condition or general harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Landings of crawfish from the rMCZ may be prohibited and this may allow local crawfish populations to improve. Any spill-over of crawfish from the rMCZ may benefit fishers in the local area. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	⇧ Confidence: Low

Table 4b. Recreation		**rMCZ Skerries Bank and Surrounds**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition. Charter boats are available for anglers to fish around Skerries Bank. The main species caught here is plaice. It has not been possible to estimate the value of angling at the site.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of crawfish from the rMCZ. No change in feature condition or general harvesting of fish and shellfish, with the exception of crawfish which are not typically targeted by anglers, is anticipated and therefore no on-site or off-site benefits are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4b. Recreation	**rMCZ Skerries Bank and Surrounds**	
Diving: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition. There are a number of dive sites in the rMCZ, including draft and reef dives at Start Point, Lannacombe Bay, Prawle Point and Bolt Tail. It has not been possible to estimate the value of diving at the site.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition (with the exception of crawfish, which are not typically a focus for divers). No change in on-site feature condition is anticipated and therefore no benefits to diving are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in dive visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK diving.	Anticipated direction of change: ⟺ Confidence: Moderate
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition. There is a visitor centre at Prawle Point that houses a telescope which can be used to view wildlife. The coastline of the rMCZ is popular for bird watching.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition (with the exception of crawfish, which are not typically a focus for wildlife watching). No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4c. Research and education	**rMCZ Skerries Bank and Surrounds**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. Research and monitoring activities take place in the rMCZ, typically focusing on the effects of the South Devon Inshore Potting Agreement and the Plymouth to Prawle Point Special Area of Conservation.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. There is a visitor centre at Prawle Point that houses interpretation boards and a telescope which can be used to view wildlife. The RSPB and Devon Wildlife Trust put on bird watching guided walks.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services	**rMCZ Skerries Bank and Surrounds**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. A potential reduction in anthropogenic pressures, including the use of	Anticipated direction of change: ⇧

Table 4d. Regulating services		**rMCZ Skerries Bank and Surrounds**
others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Confidence: Low

Table 4e. Non-use and option values		**rMCZ Skerries Bank and Surrounds**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation. Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society 'Your Seas Your Voice' campaign expressed a desire to protect the area because of a personal affinity with the area and because 'the whole place is amazing' and has 'spectacular scenery'.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ South Dorset

Site area (km^2): 192.7

Table 1. Conservation impacts — **rMCZ South Dorset**

1a. Ecological description

The recommended Marine Conservation Zone's (rMCZ's) sea floor extends from 36 to 52 metres below chart datum. It covers an area of high energy rocky and mixed sediment sea-floor habitat, and includes several records of the Features of Conservation Importance habitat subtidal chalk. The rMCZ intersects with an area of higher than average benthic habitat diversity as well as persistent summer and winter fronts, which indicate high levels of productivity. The area of the rMCZ was highlighted as an area of high conservation utility within a Marxan (conservation planning software) analysis.

Although confirmed sightings have not been found in this area, there is anecdotal evidence to suggest that this area is important as a wintering ground for seahorses (especially the short-snouted seahorse) which are known to go to great depths during the winter (Lieberknecht and others, 2011).

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				
High energy circalittoral rock	30.62	-	Unfavourable Condition	Recover to Favourable Condition
Moderate energy circalittoral rock	7.43	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal coarse sediment	27.67	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	127.06	-	Favourable Condition	Maintained at Favourable Condition
Habitats of Conservation Importance				
Subtidal chalk	-	4	Unfavourable Condition	Recover to Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ South Dorset**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications. It is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline. Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Three wrecks are recorded in the site (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impacts made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost of one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.

Table 2b. Commercial fisheries	**rMCZ South Dorset**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment which reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.	
Management scenario 1: No additional management.	
Management scenario 2: Closure of areas of high energy circalittoral rock and moderate energy circalittoral rock to bottom trawls, dredges, pots and traps, nets, and hooks and lines.	
Management scenario 3: Closure of entire rMCZ to bottom trawls and dredges.	

Table 2b. Commercial fisheries **rMCZ South Dorset**

Management scenario 4: Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, and hooks and lines.

Baseline description of activity	**Costs of impact of rMCZ on the sector**
Overview: The majority of the rMCZ lies between the 6nm (nautical mile) and 12nm limits, with a small proportion inside 6nm, and as such different fisheries restrictions apply in different parts of the rMCZ (see Annex E). Potting accounts for the majority of the fishing effort in the rMCZ and there is a low level of bottom trawling, principally by French vessels. Estimated total value of UK vessel landings from the rMCZ: £0.040m/yr.	
UK Dredges: The rMCZ does not cover a known scalloping ground and the level of dredging in the rMCZ is currently very low. Estimated value of UK dredge landings from the rMCZ: £0.002m/yr.	***Scenario 1:*** No impacts are anticipated under Scenario 1. ***Scenario 2:*** The rMCZ is not currently a regular scalloping ground and average landings from it are low. No significant impacts are therefore anticipated under this scenario. ***Scenarios 3 and 4:*** The rMCZ is not currently a regular scalloping ground and average landings from it are low. No significant impacts are therefore anticipated under these scenarios. Estimated annual value of UK dredge landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Value of landings affected	0.000	0.002	0.002	0.002

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ South Dorset</th></tr>
<tr><td>UK Bottom trawls: There is a low level of effort by UK trawlers in the rMCZ, which is located to the east of the main trawling grounds (MCZ Fisheries Model; South West Fishing Industry Group, 2011). Sole and cuttlefish are the key species targeted by trawlers. Estimated value of UK bottom trawl landings from the rMCZ: £0.010m/yr.</td><td>Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: The value of landings affected by the rMCZ is low, at £0.004m/yr. No significant impacts are therefore expected under this scenario.

Scenarios 3 and 4: The rMCZ is not currently a regular fishing ground and there is no reason to expect this to change. It is anticipated that the current low level of bottom trawl effort in the site would be displaced as a result of either management scenario, and may be redirected to the more heavily fished grounds to the west of the rMCZ (Marine Management Organisation [MMO], pers. comm., 2012; South West Fishing Industry Group, 2011).

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.004</td><td>0.010</td><td>0.010</td></tr></table></td></tr>
<tr><td>UK Pots and traps: Local potters from the ports of Weymouth and Portland may fish within the rMCZ although their effort is concentrated to the north of the rMCZ, inside 6nm. The rMCZ is not thought to be a regular potting ground (MMO, pers. comm., 2012). The potting that does occur is concentrated over the hard ground at the western end of the rMCZ. Estimated value of UK bottom trawl landings from the rMCZ: £0.020m/yr.</td><td>Scenarios 1 and 3: No impacts are anticipated under Scenarios 1 and 3.

Scenarios 2 and 4: The rMCZ is not thought to be a regular fishing ground, although the value of landings affected is not insignificant. There may be displacement as a result of either management scenario..

Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.019</td><td>0.000</td><td>0.020</td></tr></table>
In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with pots and traps at current levels. Where this is the case, this activity was not the primary reason for assigning 'recover' conservation objective(s). As</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ South Dorset</th></tr>
<tr><td></td><td>such, it is anticipated that if management is required, it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.</td></tr>
<tr><td>UK Hooks and lines: The rMCZ is not thought to be a regular fishing ground for hook and line fishers (MMO, pers. comm., 2012). Estimated value of UK hook and line landings from the rMCZ: £0.003m/yr.</td><td>Scenarios 1, 2 and 3: No impacts are anticipated under Scenarios 1, 2 and 3.

Scenario 4: The rMCZ is not a regular fishing ground. The value of landings affected is low and as such no significant impacts are anticipated under this scenario.

Estimated annual value of UK hook and line landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.000</td><td>0.003</td></tr></table>
In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with hooks and lines at current levels. Where this is the case, this activity was not the primary reason for assigning 'recover' conservation objective(s). As such, it is anticipated that if management is required, it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.</td></tr>
<tr><td colspan="2">Total direct impact</td></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.025</td><td>0.012</td><td>0.034</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.012</td><td>0.005</td><td>0.016</td></tr></table></td></tr>
<tr><td>Impact on non-UK commercial fisheries: Non-UK vessels using bottom trawls/dredges fish within the rMCZ (Lee, 2010), including 14 French bottom trawlers targeting squid, flounder, red mullet, cod, smoothhound, pouting and cuttlefish (Basse Normandie, pers. comm., 2011). Non-UK mid-water trawls</td><td>Scenario 1: No impacts are anticipated under Scenario 1.

Scenarios 2, 3 and 4: Non-UK vessels using bottom trawls/dredges, including 14 French bottom trawlers, and static gears will be affected by the rMCZ. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be £0.089m/yr (bottom</td></tr>
</table>

Table 2b. Commercial fisheries	**rMCZ South Dorset**
fish within the rMCZ (Lee, 2010), including 4 French pelagic pair trawlers targeting bass and sea bream (Basse Normandie, pers. comm., 2011). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.089m/yr; static gears: £0.000m/yr. Estimates are not available for other countries.	trawls/dredges) and £0.000m/yr (static gears). No information is available on the effect of the zoned closure to bottom trawls/dredges and static gears or on the value of landings of other country vessels.

Table 2c. National defence	**rMCZ South Dorset**
Source of costs of the rMCZ	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of sites will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities. The rMCZ is in MOD exercise and danger areas.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base. (They are not assessed for this rMCZ only.)

Table 2d. Renewable energy	**rMCZ South Dorset**
Source of costs of the rMCZ	
Management scenario 1: Increase in costs of assessing environmental impacts for licence applications. It is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline.	
Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and increase in cable protection costs for power export cables and inter-array cables in the rMCZ (relative to the mitigation provided in the baseline).	

<table>
<tr><th colspan="2">Table 2d. Renewable energy rMCZ South Dorset</th></tr>
<tr><th>Baseline description of activity</th><th>Costs of impact of rMCZ on the sector</th></tr>
<tr><td>Tidal energy: The rMCZ overlaps with the Portland tidal energy Potential Development Area (PDA) (PMSS, 2010). A potential installation could have a footprint within the PDA of 5km^2. The rMCZ is situated away from the best areas of tidal energy resource within the PDA, which lie to the north of the rMCZ off Portland Bill. As such, any future development is unlikely to overlap with the area of the rMCZ. Given that the area of best tidal energy resource is landward of the rMCZ, it is unlikely that any cables related to the installation will be sought that would pass through the rMCZ. One potential energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015 to 2020 (Department of Energy and Climate Change [DECC], pers. comm., 2011). The development in the PDA is expected to have a production capacity of 120MW by 2030 (PMSS, 2010).</td><td>Tidal energy: The estimated cost to renewable energy developers of this rMCZ is expected to fall within the following range of scenarios:
<table><tr><td>£m (one-off cost)</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Cost to the operator</td><td>0.013</td><td>0.013</td></tr></table>Scenario 1: The analysis assumes that the potential future tidal energy installation is planned in close proximity to, the rMCZ. As a result of the designation of the rMCZ, the potential licence application for the tidal energy installation will need to consider the possible effects of the construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.013m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex N for details).
Scenario 2: No cables routes are anticipated to be sought that pass through the rMCZ, so no additional costs (beyond those already set out under scenario 1) are anticipated under Scenario 2.</td></tr>
</table>

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3: Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ: South Dorset**
Commercial fishing (mid-water trawls); recreation	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ South Dorset**	
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2012). The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when in favourable and unfavourable condition (see Table 1b). A description of on-site fishing activity and the value derived from it is set out in Table 2b.	If the conservation objectives of the features are achieved, some features will be recovered to favourable condition. Others will be maintained in favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks. It is unclear whether the scale of habitat recovered and the magnitude of reduced (on-site) harvesting will be enough to have any significant positive impact on commercial stocks of mobile species. Low mobility and site-attached species populations, such as crab and lobster, may improve as a result of improved habitat condition and reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ. The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation		**rMCZ South Dorset**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when in favourable and unfavourable condition (see Table 1b). Angling from charter boats occurs occasionally within the rMCZ. This site is not considered to be that good for angling, and charter boat skippers rarely visit the area, preferring other marks on the Dorset coastline (Weymouth & Portland Licensed Skippers Association, pers. comm., 2011). A new bass mark has, however, been recently identified within the rMCZ. It has not been possible to estimate the value of angling in the site.	If the conservation objectives of the features are achieved, some features will be recovered to favourable condition. Others will be maintained in favourable condition. Recovery of habitats may have benefits to fish populations. It is unclear whether any benefits to fish populations would arise as a result of reduced fishing mortality due to management of commercial fishing (see Table 4a). If the rMCZ results in an increase in the size and diversity of species caught by anglers then this is expected to improve the quality of angling at the site and therefore the value of the ecosystem service. The designation may lead to an increase in angling visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK angling.	Anticipated direction of change: ⇧ Confidence: Low
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Wildlife watching is not known to take place in the rMCZ.	N/A	N/A

Table 4c. Research and education		**rMCZ South Dorset**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out in the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧

Table 4c. Research and education		**rMCZ South Dorset**
		Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ South Dorset**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore it is unlikely to contribute to natural hazard protection (Fletcher and others, 2012). It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives are achieved some of the features will be recovered to favourable condition. Others will be maintained in favourable condition. Improved habitat condition and a potential reduction in anthropogenic pressures, including the use of bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values		**rMCZ South Dorset**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ Reference Area South Dorset

Site area (km^2): 25.0

Table 1. Conservation impacts				**rMCZ Reference Area South Dorset**
1a. Ecological description				
The recommended Marine Conservation Zone's (rMCZ's) sea floor extends from 36 to 52 metres below chart datum. It covers an area of high energy and includes several records of the Feature of Conservation Importance habitat subtidal chalk. The rMCZ intersects with an area of higher than average benthic habitat diversity as well as persistent summer and winter fronts, which indicate high levels of productivity. Although confirmed sightings have not been found in this area, there is anecdotal evidence to suggest that this area is important as a wintering ground for seahorses (especially the short-snouted seahorse) which are known to go to great depths during the winter (Lieberknecht and others, 2011).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
High energy circalittoral rock	20.53	-	Unfavourable Condition	Recover to Reference Condition
Moderate energy circalittoral rock	3.70	-	Unfavourable Condition	Recover to Reference Condition
Subtidal mixed sediments	0.78	-	Unfavourable Condition	Recover to Reference Condition
Habitats of Conservation Importance				
Subtidal chalk	-	3	Unfavourable Condition	Recover to Reference Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ Reference Area South Dorset**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Items of archaeological interest are recorded in the site, including the recorded wreck of the Mallard (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impacts made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost of one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). If archaeologists respond to the prohibition of excavation by undertaking an alternative archaeological excavation in another locality, this could result in additional costs to the archaeologists. As it is not possible to predict when or how often this could occur, this is not costed in the Impact Assessment. The prohibition of excavation and therefore interpretation of archaeological evidence from the site will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

Table 2b. Commercial fisheries	**rMCZ Reference Area South Dorset**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment, which reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.	
Management scenario 1: Closure of rMCZ to all commercial fishing, except mid-water trawls.	

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ Reference Area South Dorset</th></tr>
<tr><td colspan="2">Management scenario 2: Closure of rMCZ to all commercial fishing.</td></tr>
<tr><th>Baseline description of activity</th><th>Costs of impact of rMCZ on the sector</th></tr>
<tr><td colspan="2">Overview: The rMCZ lies between the 6nm (nautical mile) and 12nm limits and a number of existing fisheries restrictions apply (see Annex E). There is a low level of dredging, bottom trawling and potting by UK vessels in the rMCZ (MCZ Fisheries Model). French demersal trawlers, which have historical fishing rights, are active in the rMCZ (South West Fishing Industry Group, 2011; Lee, 2010). Estimated total value of UK vessel landings from the rMCZ: £0.019m/yr.</td></tr>
<tr><td>UK Dredges: The rMCZ does not cover a known scalloping ground and the level of dredging in the rMCZ is currently very low. Estimated value of UK dredge landings from the rMCZ: £0.001m/yr.</td><td>Scenarios 1 and 2: The rMCZ is not currently a regular scalloping ground and average landings from it are low. No significant impacts are therefore anticipated.

Estimated annual value of UK dredge landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.001</td><td>0.001</td></tr></table></td></tr>
<tr><td>UK Bottom trawls: There is a low level of effort by UK trawlers in the rMCZ, which is located to the east of the main trawling grounds (MCZ Fisheries Model; South West Fishing Industry Group, 2011). Sole and cuttlefish are the key species targeted by trawlers. Estimated value of UK bottom trawl landings from the rMCZ: £0.002m/yr.</td><td>Scenarios 1 and 2: The value of landings affected by the rMCZ is low, at £0.002m/yr. No significant impacts are therefore expected as a result of the rMCZ.

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:

<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.002</td><td>0.002</td></tr></table></td></tr>
<tr><td>UK Pots and traps: Local under 15 metre potters from the ports of Weymouth and Portland may fish within the rMCZ, although their effort is concentrated to the north of the rMCZ, inside 6nm (MCZ Fisheries Model; Marine Management Organisation [MMO], pers. comm., 2012). The rMCZ is not thought to cover a regular potting ground (MMO, pers. comm., 2012).. Estimated value of UK bottom trawl landings from the rMCZ: £0.016m/yr.</td><td>Scenarios 1 and 2: The rMCZ is not a regular fishing ground. There may be displacement as a result of either management scenario, with effort likely to be redirected to the more heavily fished grounds to the north of the rMCZ.

Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ Reference Area South Dorset</th></tr>
<tr><td colspan="2"></td><td><table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.016</td><td>0.016</td></tr></table></td></tr>
<tr><td colspan="3">Total direct impact</td></tr>
<tr><td colspan="2">Total direct impact on UK commercial fisheries</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.019</td><td>0.019</td></tr><tr><td>GVA affected</td><td>0.009</td><td>0.009</td></tr></table></td></tr>
<tr><td colspan="2">Impact on non-UK commercial fisheries: Non-UK vessels using bottom trawls/dredges fish within the rMCZ (Lee, 2010), including 14 French bottom trawlers targeting squid, flounder, red mullet, cod, smoothhound, pouting and cuttlefish (Basse Normandie, pers. comm., 2011). Non-UK mid-water trawls fish within the rMCZ (Lee, 2010), including 4 French pelagic pair trawlers targeting bass and sea bream (Basse Normandie, pers. comm., 2011).

Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.011m/yr; static gears: £0.000m/yr (Comité National des Pêches Maritimes et des Elevages Marins Model, 2011). Estimates are not available for other countries.</td><td>Scenario 1: Non-UK vessels using bottom trawls/dredges, including 14 French bottom trawlers, will be affected by the rMCZ. The estimated value of French landings affected by this management scenario will be £0.011m/yr (bottom trawls/dredges).

Scenario 2: In addition to the impacts described under Scenario 1, non-UK mid-water trawlers will also be affected under Scenario 2. No further information on the impacts of the rMCZ was received from non-UK fisheries organisations and associations. It has not been possible to obtain information on the value of non-UK vessel landings affected by the rMCZ.</td></tr>
</table>

Table 2c. Recreation	**rMCZ Reference Area South Dorset**
Source of costs of the rMCZ	
Recreational angling management scenario: closure of rMCZ to recreational angling and to anchoring (except in emergency).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Angling: Angling from charter boats occurs occasionally within the rMCZ. This site is not considered to be good for angling, and charter boat skippers rarely visit the area, preferring other marks on the Dorset coastline. (Weymouth & Portland Licensed Skippers Association, 2011). However, a new bass mark has been identified recently within the rMCZ. Angling vessels occasionally drop anchor in the site (Weymouth & Portland Licensed Skippers Association, 2011).	As the area of the rMCZ is not popular with anglers, the propensity of individuals to go angling off the Dorset coast and the quality of their experience are not expected to be affected by its closure to angling and anchoring (except in emergency). No significant costs are expected.

Table 2d. Renewable energy	**rMCZ Reference Area South Dorset**
Source of costs of the rMCZ	
Management scenario 1: Installation of devices and cables not permitted within the rMCZ. Increase in costs of assessing environmental impacts for licence applications with 1km of the rMCZ. It is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Tidal energy: The eastern half of the rMCZ overlaps with the Portland tidal energy Potential Development Area (PDA) (PMSS, 2010). Any potential installation could have a footprint within the PDA of 5km^2. The rMCZ is situated away from the best areas of tidal energy resource within the PDA, which lie to the north of the rMCZ off Portland Bill. As such, any future development is unlikely to overlap with the area of the rMCZ. Given that the area of best tidal energy resource is landward of the rMCZ, it is unlikely that	***Tidal energy:*** Assuming that any future development and its export cables do not overlap with the rMCZ, the estimated cost to renewable energy developers of this rMCZ is expected to fall within the following range of scenarios: *£m (one-off cost)* — Scenario 1 Cost to the operator — 0.012

Table 2d. Renewable energy	**rMCZ Reference Area South Dorset**
any cables related to the installation will be sought that would pass through the rMCZ. One potential energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015 to 2020 (Department of Energy and Climate Change [DECC], pers. comms., 2011). The development in the PDA is expected to have a production capacity of 120MW by 2030 (PMSS, 2010).	The analysis assumes that the potential future tidal energy installation is planned within, or within close proximity to, the rMCZ. As a result of the designation of the rMCZ, the licence application for the installation will be required to consider the possible effects of the construction and operational activities on the features protected by the rMCZ and the potential to achieve the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.012m in 2015 (based on an average cost provided by renewable energy developers; see Annex N for details). No cables are expected to pass through the rMCZ, so no additional costs associated with re-routing cables around the rMCZ are anticipated..

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Reference Area South Dorset**
None.	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ Reference Area South Dorset**	
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Circalittoral rock is the predominant habitat in the rMCZ, and provides a firm substrate for species attachment and important inshore crab and lobster fisheries (Fletcher and others, 2011). The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when not in unfavourable condition. A description of on-site fishing activity and the value derived from it is set out in Table 2b.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ, the costs of which are set out in Table 2b. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks. As the rMCZ is relatively small it is unclear whether it would have any impact on stocks of mobile commercial finfish species. Low mobility and site-attached species populations, such as crab and crawfish, may improve as a result of reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ. As no fishing will be permitted within the rMCZ, no on-site benefits will be realised. The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ Reference Area South Dorset**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear	Anticipated direction of change:

Table 4b. Recreation		**rMCZ Reference Area South Dorset**
The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by features of the site when in unfavourable condition (see Table 1b). A description of on-site angling activity is set out in Table 2c. It has not been possible to estimate the value of angling in the site.	whether any benefits to fish populations would arise as a result of reduced fishing mortality due to management of commercial fishing (see Table 4a). As angling will not be permitted within the rMCZ, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers. Such benefits may be insignificant.	⇧ Confidence: Low
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Wildlife watching is not known to take place in the rMCZ.	N/A	N/A

Table 4c. Research and education		**rMCZ Reference Area South Dorset**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activity is focused on the area of the rMCZ.	As an rMCZ Reference Area, the site will provide an opportunity to demonstrate the state of its designated marine features in the context of prevailing environmental conditions and in the absence of many anthropogenic pressures. It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of education resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧

Table 4c. Research and education	**rMCZ Reference Area South Dorset**	
		Confidence: Low

Table 4d. Regulating services	**rMCZ Reference Area South Dorset**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore, its features are not thought to contribute to the delivery of this service. It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved the features will be recovered to reference condition. Improved habitat condition and a reduction in anthropogenic pressures, including the use of bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ Reference Area South Dorset**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in	Anticipated direction of change: ⇧

Table 4e. Non-use and option values		**rMCZ Reference Area South Dorset**
value of the rMCZ.	the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Confidence: Moderate

rMCZ South of Celtic Deep

Site area (km^2): 552.4

Table 1. Conservation impacts	**rMCZ South of Celtic Deep**

1a. Ecological description

The western boundary of this recommended Marine Conservation Zone aligns with the UK Continental Shelf Limit. The south-eastern tip of the site is approximately 90km to the north-west of the Land's End peninsula. The site is within the 50–100 metre depth range, with two small areas dipping beneath the 100 metre contour. The sea floor is characterised by coarse sediment and sand, with some mixed sediment present (Lieberknecht and others, 2011)

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				
Subtidal coarse sediment	308.06	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mixed sediments	46.37	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	193.47	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mud	4.21	-	Unfavourable Condition	Recover to Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Commercial fisheries	**rMCZ South of Celtic Deep**

Source of costs of the rMCZ

The Joint Nature Conservation Committee (JNCC) and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment, which reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.

Management scenario 1: No additional management.

Table 2a. Commercial fisheries **rMCZ South of Celtic Deep**

Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.

Management scenario 3: Closure of entire rMCZ to bottom trawls and dredges; closure of area of sub-tidal mixed sediment to pots and traps, nets, and hooks and lines.

Management scenario 4: Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, and hooks and lines.

Baseline description of activity	**Costs of impact of rMCZ on the sector**
Overview: The rMCZ is close to the south-western edge of the UK's 200 nautical mile (nm) fishery limit and the UK's exclusive economic zone. Fishing effort is dominated by UK, French and Irish otter trawlers, with lower levels of UK and Belgian beam trawling (Lee, 2010; South West Fishing Industry Group, 2011; MCZ Fisheries Model). UK gill netters work throughout the rMCZ and account for the majority of UK vessel landings (MCZ Fisheries Model). Estimated total value of UK vessel landings from the rMCZ: £0.037m/yr.	
UK Bottom trawls: The rMCZ lies on the western side of an area of significant UK beam trawl activity (MCZ Fisheries Model). As the rMCZ is well offshore, only larger beam trawlers, typically of between 20 and 40 metres in length, tend to fish in the area (Beam trawl skipper, pers. comm., 2011). Vessels active in the wider area (defined as ICES Rectangles 29E3 and 30E3) principally target monkfish, sole and megrim (MMO, 2011a). Estimated value of UK bottom trawl landings from the rMCZ: £0.005m/yr.	***Scenario 1:*** No impacts are anticipated under Scenario 1. ***Scenarios 2, 3 and 4:*** The value of landings affected is low, and the level of effort displaced from the rMCZ is therefore also expected to be low. No significant impacts are anticipated under these scenarios. Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:
UK Nets: A description of the baseline is not available for this rMCZ. Estimated value of UK net landings from the rMCZ: £0.032m/yr.	***Scenarios 1 and 2:*** No impacts are anticipated under Scenarios 1 and 2. ***Scenarios 3 and 4:*** A relatlvey moderate leve of value of landings will be affected under these scenarios. No further information on the potential impacts was obtained. . Estimated annual value of UK net landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Value of landings affected	0	0.005	0.005	0.005

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4

Table 2a. Commercial fisheries — **rMCZ South of Celtic Deep**

	Value of landings affected: 0 | 0 | 0.006 | 0.032 In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with nets at current levels. Where this is the case, this activity was not the primary reason for assigning recover conservation objective(s). As such, it is anticipated that if management is required, it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.
Total direct impact	
Total direct impact on UK commercial fisheries:	Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range: *£m/yr* | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 Value of landings affected | 0.000 | 0.005 | 0.011 | 0.037 GVA affected | 0.000 | 0.002 | 0.005 | 0.016
Impact on non-UK commercial fisheries: Non-UK vessels using static gears, bottom trawls/dredges – in particular French and Irish otter trawlers, with lower levels of Belgian beam trawling – and mid-water trawls fish within the rMCZ (Lee, 2010; JNCC, pers. comm., 2011). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.172m/yr; static gears: £0.001m/yr (Comité National des Pêches Maritimes et des Elevages Marins Model, 2011).	***Scenario 1:*** No impacts are anticipated under Scenario 1. ***Scenarios 2, 3 and 4:*** Non-UK vessels using static gears, bottom trawls/dredges – in particular French and Irish otter trawlers – will be affected by the rMCZ. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be £0.172m/yr (bottom trawls/dredges) and £0.001m/yr (static gears). No information is available on the effect of the zoned closure on static gears or the impact on Belgian or Irish vessels.

Table 2b. Other impacts that are assessed for the suite of MCZs and not for this site alone — **rMCZ South of Celtic Deep**

Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and telecom cables are assessed in the Evidence Base, Annex H3 and Annex N3 (they are not assessed for this site alone).

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ South of Celtic Deep**
Cables (existing interconnectors and telecom cables)	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ South of Celtic Deep**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2011). The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when in unfavourable condition (see Table 1b). A description of on-site fishing activity and the value derived from it is set out	If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2a. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks.	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ South of Celtic Deep**
in Table 2a.	The rMCZ is relatively large with a relatively high level of current fishing effort, and the potential reduction in fishing pressure may benefit commercial stocks of mobile and less mobile species. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits. The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	

Table 4b. Recreation		**rMCZ South of Celtic Deep**
Baseline	**Beneficial impact**	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education		**rMCZ South of Celtic Deep**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out in the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence:

Table 4c. Research and education		**rMCZ South of Celtic Deep**
		High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ South of Celtic Deep**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore it is unlikely to contribute to providing natural hazard protection. It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives are achieved the features will be recovered to favourable condition. Improved habitat condition and a potential reduction in anthropogenic pressures, including from bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ South of Celtic Deep**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ South of Falmouth

Site area (km^2): 25.0

Table 1. Conservation impacts				**rMCZ South of Falmouth**
1a. Ecological description				
The site is located in an area of seasonal frontal systems, which means that the area has high productivity and scores highly as an area of additional ecological (pelagic) importance. The depth of the site ranges from 77 to 83 metres (Lieberknecht and others, 2011)				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
Moderate energy circalittoral rock	2.69	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal coarse sediment	22.29	-	Unfavourable Condition	Recover to Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Commercial fisheries	**rMCZ South of Falmouth**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment, which reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.	
Management scenario 1: No additional management.	
Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.	
Management scenario 3: Closure of entire rMCZ to bottom trawls and dredges; closure of area of moderate energy circalittoral rock in the rMCZ to pots and traps, nets, and hooks and lines.	

Table 2a. Commercial fisheries **rMCZ South of Falmouth**

Management scenario 4: Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, and hooks and lines.

Baseline description of activity

Overview: The rMCZ sits between the 6nm (nautical mile) and 12nm limits. A wide variety of fishing activity occurs in the wider area, which can result in gear conflict problems. There is a gentlemen's agreement between static and mobile gear fishers, particularly netters and French trawlers, which enables static gear to be used at neap tides without risk of gear being accidentally towed away (Cornish Fish Producers Organisation, pers. comm., 2010). Many smaller potters and netters limit their activities in the area, preferring to stay inside the 6nm limit and so avoiding much of the gear conflict with larger trawlers. Bottom trawl and scalloping vessels, principally from Cornwall and Devon, fish in the area and there is significant effort from nomadic and French vessels that bottom trawl/dredge. Netters use tangle nets for brill, turbot and ray and wreck nets for pollack, cod and ling (for which there may be specific marks within the rMCZ) (Cornwall Inshore Fisheries and Conservation Authority (IFCA), pers. comm., 2010). Estimated total value of UK vessel landings from the rMCZ: £0.027m/yr.

UK Dredges: The rMCZ is located on the western edge of one of the most heavily fished scalloping areas in the south-west. The ground in and around the rMCZ tends to be rockier than that further east and is generally thought to be less viable for scallop dredging than elsewhere (Scallop dredge skipper, pers. comm., 2011), and as such fishing effort is relatively low. Outputs from the MCZ Fisheries Model also indicate that the rMCZ is adjacent to an area of high fishing effort. Estimated value of UK dredge landings from the rMCZ: £0.002m/yr.

Feedback from Cornwall IFCA states that this estimate may be an underestimate (Cornwall IFCA, pers. comm., 2012). No alternative estimate is available.

Costs of impact of rMCZ on the sector

Scenario 1: No impacts are anticipated under Scenario 1.

Scenarios 2, 3 and 4: The estimated value of the rMCZ area for scalloping is not significant. The rMCZ will, however, remove the option to fish there in the future if the ground were to become more viable at any time.

There are concerns that gear conflict may intensify in the areas surrounding the rMCZ as a result of displacement, which may threaten the exsisting gentlemen's agreement between static and mobile gear fishers (Cornwall IFCA, pers. comm., 2010; South West Fishing Industry Group, 2011). However, given the relatively low level of effort thought to occur in the rMCZ, any affect on existing gear conflict problems is likely to be minimal.

Estimated annual value of UK dredge landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Value of landings affected	0	0.002	0.002	0.002

Table 2a. Commercial fisheries **rMCZ South of Falmouth**

UK Bottom trawls: The rMCZ is located between two important trawling grounds, one extending to the north and east up the English Channel, which is fished all year, and the other to the south-west. The area to the north and east of the rMCZ is particularly important during winter months when bad weather often prohibits fishing in grounds further west (Beam trawl skipper, pers. comm., 2011; Otter trawl skipper, pers. comm., 2011). Outputs from the MCZ Fisheries Model also indicate that the rMCZ is adjacent to an area of high fishing effort. The ground in and around the rMCZ tends to be rockier than that further east and is typically less viable to bottom trawl (Beam trawl skipper, pers. comm., 2011), and as such fishing effort is relatively low. Estimated value of UK bottom trawl landings from the rMCZ: £0.003m/yr.

Feedback from Cornwall IFCA states that this estimate may be an underestimate (Cornwall IFCA, pers. comm., 2012). However no alternative estimate is available.

Scenario 1: No impacts are anticipated under Scenario 1.

Scenarios 2, 3 and 4: The estimated value of the rMCZ area for trawlers is low. Displaced vessels may increase effort in the surrounding fisheries. The rMCZ will remove the option to fish here in the future, particularly during winter months, if the ground were to become more viable.

There are concerns that gear conflict may intensify in the areas surrounding the rMCZ as a result of displacement, which may threaten the exsisting gentlemen's agreement between static and mobile gear fishers (Cornwall IFCA, pers. comm., 2010; South West Fishing Industry Group, 2011). However, given the relatively low level of effort thought to occur in the rMCZ, any affect on existing gear conflict problems is likely to be minimal.

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Value of landings affected	0	0.003	0.003	0.003

<table>
<tr><th>Table 2a. Commercial fisheries</th><th>rMCZ South of Falmouth</th></tr>
<tr><td>UK Pots and traps: The rMCZ is located within an area of relatively high potting intensity off the Lizard peninsula. Potting vessels, typically of less than 15 metres and from ports in south-west Cornwall, primarily target brown crabs. Estimated value of UK pots and traps landings from the rMCZ: £0.017m/yr.</td><td>
Scenarios 1 and 2: No impacts are anticipated under Scenarios 1 and 2.

Scenario 3: Closure of This management scenario closes an area of rocky ground in the south-west corner of the rMCZ to pots and traps. The value of landings affected is estimated to be relatively low and as such no significant impacts are anticipated.

Scenario 4: This management scenario will remove a part of a relatively intensively fished ground from potters. The intensity of potting further inshore, combined with potential gear conflict issues outside 6nm, may make it difficult for affected fishers to redistribute their displaced fishing effort.

Gear conflict may intensify in the areas surrounding the rMCZ as a result of displacement (Cornwall IFCA, pers. comm., 2010; South West Fishing Industry Group, 2011). This may threaten the continuation of the existing gentlemen's agreement between static and mobile gear fishers and ultimately affect a larger value of landings than that identified above (South West Fishing Industry Group, 2011).

Estimated annual value of UK pots and traps landings affected is expected to fall within the following range:
<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.003</td><td>0.017</td></tr>
</table>
In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with pots and traps at current levels. Where this is the case, this activity was not the primary reason for assigning recover conservation objective(s). As such, it is anticipated that if management is required, it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.
</td></tr>
</table>

Table 2a. Commercial fisheries **rMCZ South of Falmouth**

UK Nets: The rMCZ is located just outside 6nm and is immediately to the east of an area of relatively high netting intensity (MCZ Fisheries Model). The intensity of netting drops outside 6nm and therefore in the rMCZ, because outside 6nm netters are more prone to gear conflict issues with larger mobile gear fishers (which are not permitted to fish within 6nm). The netters typically use vessels of less than 15 metres and are from ports in south-west Cornwall. They use tangle nets for brill, turbot and ray and wreck nets for pollack, cod and ling (Cornwall IFCA, pers. comm., 2010). Estimated value of UK vessel net landings from the rMCZ: £0.004m/yr.

Scenarios 1 and 2: No impacts are anticipated under Scenarios 1 and 2.

Scenario 3: This management scenario closes an area of rocky ground in the south-west corner of the rMCZ to nets. The value of landings affected is estimated to be relatively low and as such no significant impacts are anticipated.

Scenario 4: This management scenario will remove a part of a fishing ground from netters. The intensity of netting inside the 6nm limit, combined with potential gear conflict issues outside 6nm, may make it difficult for affected fishers to redistribute their displaced fishing effort.

Gear conflict may intensify in the areas surrounding the rMCZ as a result of displacement (Cornwall IFCA, pers. comm., 2010; South West Fishing Industry Group, 2011). This may threaten the continuation of the existing gentlemen's agreement between static and mobile gear fishers and ultimately affect a larger value of landings than that identified above (South West Fishing Industry Group, 2011).

Estimated annual value of UK net landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Value of landings affected	0.000	0.000	0.001	0.004

In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with nets at current levels. Where this is the case, this activity was not the primary reason for assigning 'recover' conservation objective(s). As such, it is anticipated that if management is required, it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.

Total direct impact

Table 2a. Commercial fisheries — **rMCZ South of Falmouth**

Total direct impact on UK commercial fisheries

Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Value of landings affected	0.000	0.005	0.009	0.026
GVA affected	0.000	0.002	0.004	0.012

Impact on non-UK commercial fisheries: Non-UK vessels using static gears, bottom trawls/dredges and mid-water trawls fish within the rMCZ (Lee, 2010). There are 14 French vessels of more than 15 metres that bottom trawl in the rMCZ for species including rays, squid, cuttlefish, pollack and bass (Basse Normandie, pers. comm., 2011). They fish in the rMCZ all year round. Rising fuel costs have resulted in an increase in activity by these boats in the wider south-west region (Basse Normandie, pers. comm., 2011).

Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.029m/yr; static gears: £0.001m/yr (Comité National des Pêches Maritimes et des Elevages Marins Model, 2011). Estimates are not available for other countries.

Scenario 1: No impacts are anticipated under Scenario 1.

Scenarios 2, 3 and 4: Non-UK vessels using static gear and bottom trawls/dredges will be affected by the rMCZ, including 14 French bottom trawlers. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be £0.029m/yr (bottom trawls/dredges) and £0.001m/yr (static gears). No information is available on the effect of the zoned closure on static gears or on the value of landings of other countries' vessels.

Table 2b. National defence — **rMCZ South of Falmouth**

Source of costs of the rMCZ

Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of sites will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.

Baseline description of activity	**Costs of impact of rMCZ on the sector**

Table 2b. National defence	**rMCZ South of Falmouth**
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities. The rMCZ is in an MOD danger area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base. (They are not assessed for this rMCZ alone.)

Table 2c. Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ South of Falmouth**
Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and telecom cables are assessed in the Evidence Base, Annex H3 and Annex N3 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ South of Falmouth**
Cables (existing interconnectors and telecom cables), commercial fishing (mid-water trawls),	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ South of Falmouth**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2011). The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when in unfavourable condition (see Table 1b). A description of on-site fishing activity and the value derived from it is set out in Table 2a.	If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2a. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks. As the rMCZ is relatively small it is unclear whether it would have any impact on stocks of mobile commercial finfish species. Low mobility and site-attached species populations, such as crab and crawfish, may improve as a result of reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits. If MCZ management involves reduced mobile gear effort but no reductions in static gear fishing, this may reduce gear conflict between mobile and static gear fishers. Reduced gear conflict may reduce the cost of fishing in the rMCZ for static gear fishers. The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ South of Falmouth**	
Baseline	**Beneficial impact**	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education	**rMCZ South of Falmouth**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out in the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services	**rMCZ South of Falmouth**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats and rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore it is unlikely to contribute to providing natural hazard protection. It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives are achieved the features will be recovered to favourable condition. Improved habitat condition and a potential reduction in anthropogenic pressures, including from bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ South of Falmouth**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ South of Portland

Site area (km^2): 17.5

Table 1. Conservation impacts — **rMCZ South of Portland**

1a. Ecological description

The recommended Marine Conservation Zone (rMCZ) partially overlaps with the Studland to Portland draft Special Area of Conservation and is located just less than 0.5km to the south-west of Portland Bill, extending out for about 6km, with a width of approximately 3km. The rMCZ is in the 30 to 60 metre depth range. It covers 55% (8.72 km^2) of the Portland Deep, an Ecological Network Guidance listed geological/geomorphological feature of importance. The Portland Deep is a depression in the sea bed off the south-west of Portland Bill, and the area is characterised by strong tidal streams (the Portland Race).

The north-western corner of the site includes an area of coarse and sandy sediment ripples on the sea bed. The southern and western side of Portland has been mapped as an area of higher than average benthic species diversity. The rMCZ is also important for sea birds, in winter and the breeding season, and cetaceans. Anecdotal evidence indicates that there are bream nests in the area (Lieberknecht and others, 2011)

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				
High energy circalittoral rock	1.54	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy circalittoral rock	7.63	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	2.50	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	3.00	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	0.85	-	Favourable condition	Maintained at favourable condition
Geological and Geomorphological Features of Interest				
Portland Deep	-	-	Favourable Condition	Maintained at Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. National defence	**rMCZ, South of Portland**
Source of costs of the rMCZ	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of sites will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities, as well as seabed sampling. The rMCZ is in an MOD exercise area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base. (They are not assessed for this rMCZ alone.)

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ South of Portland**
Commercial fishing (dredges, bottom trawls, pots & traps, nets, hooks & lines), recreation, water abstraction, discharge and diffuse pollution*.	

* The IA aassumes that no additional mitigation of the 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 Plan process (Natural England, pers. comm., 2010).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ South of Portland**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. Circalittoral and infralittoral rock are important habitats for inshore commercial fisheries species (particularly crab and lobster) as are subtidal sediments (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. Commercial fishing in the rMCZ is limited, primarily due to the strength of the tide in the area. Potting is the main fishing gear used in the rMCZ, targeting rocky areas. Estimated value of UK vessel landings: £0.013m/yr.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No additional management (above that in the baseline situation) of fishing activities is expected. No change in feature condition or harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (because, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4b. Recreation		**rMCZ South of Portland**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. The Portland area, particularly Portland Bill, is a popular angling spot. Species include mullet, wrasse, bass, pollack, garfish and mackerel. Charter boats visit	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition or fishing mortality is anticipated and therefore no on-site or off-site benefits are expected (see Table 4a for further details). Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4b. Recreation		**rMCZ South of Portland**
the area. It has not been possible to estimate the value of angling in the site.	The designation may lead to an increase in angling visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK angling.	
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition. The Portland and Portland Bill area is rich with wildlife. Alongside many different species of birds, dolphins and whales can be spotted in the area from the coastal path. Local companies offer boat trips for visitors to experience the wildlife. It has not been possible to estimate the value of wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits). The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK wildlife watching visits.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4c. Research and education		**rMCZ South of Portland**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. The rMCZ overlaps with a draft Special Area of Conservation, the Portland	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧

Table 4c. Research and education		**rMCZ South of Portland**
Deep geological feature and the Portland Race. Past and future research is anticipated as a result of the designation and geological feature.		Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. The Portland Deep and Portland Race may form part of existing education resources, although no specific information could be found.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. However, sea conditions caused by the Portland Race can be seen from the shore. MCZ designation may provide an opportunity to expand the focus of education events on the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors to the south Portland coast would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ South of Portland**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore it is unlikely to contribute to	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4d. Regulating services		**rMCZ South of Portland**
natural hazard protection. It has not been possible to estimate the value of regulating services in the site.		

Table 4e. Non-use and option values		**rMCZ South of Portland**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will maintain and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from the risk of future degradation. Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society's 'Your Seas Your Voice' campaign expressed a desire to protect areas within the rMCZ because 'the whole place is amazing' and it has a 'wide range of plants and animals'.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ South of the Isles of Scilly

Site area (km^2): 132.2

Table 1. Conservation impacts				**rMCZ South of the Isles of Scilly**
1a. Ecological description				
This site is located approximately 15km to the south of the Isles of Scilly. The depth is within the range of 50 to 100 metres, with the western tip dipping below the 100 metre contour. The sea floor is predominantly coarse sediment, with some patches of sand present (Lieberknecht and others, 2011).				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
Subtidal coarse sediment	115.21	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	16.98	-	Unfavourable Condition	Recover to Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Commercial fisheries	**rMCZ South of the Isles of Scilly**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment which reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.	
Management scenario 1: No additional management.	
Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**

Table 2a. Commercial fisheries **rMCZ South of the Isles of Scilly**

Overview: The rMCZ is outside the 6nm (nautical mile) limit and straddles the 12nm limit, and a number of existing fishing restrictions apply (see Annex E). The rMCZ covers an area used primarily by bottom trawlers; however, other gear types are also used in the area (MCZ Fisheries Model). French demersal fishers have historical rights inside 12nm and are active throughout the rMCZ (Lee, 2010). Fishing with static gears is low, as effort is concentrated just to the north of the rMCZ inside 6nm, where Cornwall Inland Fisheries and Conservation Authority vessel size byelaws offer some protection from gear conflict between static and mobile gears (South West Fishing Industry Group, 2011). Estimated total value of UK vessel landings from the rMCZ: £0.046m/yr.

UK Dredges: Dredging occurs throughout the rMCZ, although at a low level. Estimated value of UK vessel dredge landings from the rMCZ: £0.003m/yr.

The rMCZ has historically been fished more heavily than at present (Scallop vessel owner, pers. comm., 2011). As scalloping is carried out on a cyclical basis it is expected that, despite the low level of activity in the last 4 years, the fishery may be targeted again in future years (Scallop vessel owner, pers. comm., 2011). This may particularly be the case when larger vessels return from the eastern channel, where scalloping effort has been very high in recent years as a result of increased scallop abundance in the area (Defra, 2011). This may result in higher annual landings from the rMCZ.

Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: The value of landings affected by the rMCZ under this scenario is small, at £0.003m/yr. No significant impacts are therefore expected as a result of the designation. However, the rMCZ will remove an area of known potential from being fished in the future. When the current prolificacy of the eastern channel area reduces, scallopers may begin to target the rMCZ again (Scallop dredge owner, pers. comm., 2011). As such the estimate of the value of landings affected may be an underestimate of future landings.

Estimated annual value of UK dredge landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2
Value of landings affected	0.000	0.003

UK Bottom trawls: A large number of trawlers fish in and around the rMCZ.

Beam trawlers fishing in the rMCZ principally target sole, megrim and monkfish (Beam trawl skipper, pers. comm., 2011). These vessels typically use beams of 8 metres or more, which means that they are not permitted to fish inside 12nm, and therefore their activity within the rMCZ is concentrated in the southern half (which is outside 12nm) (Beam trawl skipper, pers. comm., 2011). There is evidence of beam trawlers fishing for up to 38 days a year (Mamza, 2011) in the wider area (International Council for the Exploration of the Sea [ICES] Rectangle 28E3). Vessels may fish in the area

Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: In response to this management scenario, it is anticipated that effort of beam trawlers fishing outside 12nm will be displaced and that they will continue to fish in the wider area. They would be pushed further south and west by the rMCZ, and would have to start their tows further offshore (Beam trawl skipper, pers. comm., 2011). This would increase steaming costs of getting to the fishing ground, as well as reducing the overall area of the fishery available to them. It may also make the ground less accessible in marginal weather, increasing risks to safety as vessels push further offshore.

<table>
<tr><th colspan="2">Table 2a. Commercial fisheries</th><th>rMCZ South of the Isles of Scilly</th></tr>
<tr><td colspan="2">of the rMCZ or may tow through the area as a final trawl when returning to port from fishing further offshore. Trawlers working 4 metre beams are permitted to fish inside 12nm and therefore can fish in the northern half of the rMCZ. However, the water is generally considered too deep for such vessels and their activity is concentrated further inshore, to the north-east of the rMCZ (Beam trawl skipper, pers. comm., 2011).

Otter trawl vessels, typically from 10 to 30 metres in length, work in and around the rMCZ, targeting haddock, john dory, lemon sole, monkfish and megrim (Otter trawl skipper, pers. comm., 2011; MMO, 2011a). The area is fished when the weather permits, which is typically during the summer. As an example, around 25% (50 days) of one vessel's total days at sea are spent in the surrounding area (Otter trawl skipper, pers. comm., 2011). The western edge of the rMCZ is close to the western edge of the otter trawl ground, beyond which the water becomes too deep for the gear set-up of most vessels. Otter trawling is concentrated in the corridor between the 6nm and 12nm limits, with vessels carrying out one or two tows with each tide, covering around 12nm in each direction. The tow direction is largely dependent on the tide, which runs in a south-west/north-east direction, with vessels preferring to tow with the tide (Otter trawl skipper, pers. comm., 2011).

Estimated value of UK bottom trawl landings from the rMCZ: £0.037m/yr.</td><td>As most vessels fishing in the area are not permitted to fish inside the Isles of Scilly 6nm limit, the position of the rMCZ leaves a thin area to its north through which vessels fishing inside 12nm can tow. Otter trawlers, the majority of which cannot shift further offshore due to the depth of the water, would be squeezed into this area, or into the more heavily fished area to the east of the rMCZ towards the west Cornwall coast. The position of the rMCZ would mean that vessels may need to start tows far earlier, only carry out one tow per tide, or carry out a reduced-length tow, which may affect the productivity of the vessels (Otter trawl skipper, pers. comm., 2011).

The preference of skippers to tow with the tide means that otter trawlers would no longer be likely to fish in a currently fished area that extends to the south-west from the rMCZ (Otter trawl skipper, pers. comm., 2011). Assuming that this additional area is no longer fished as a result of the rMCZ, as well as the rMCZ itself, the total value of bottom trawl landings affected by the rMCZ would be £0.064m/yr. This higher figure, rather than the baseline estimate of value of landings for the rMCZ alone has been used to estimate the total value of landings affected by the rMCZ.

Estimated annual value of landings by UK bottom trawls affected by the rMCZ is expected to fall within the following range:

<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.064</td></tr>
</table>
</td></tr>
<tr><th colspan="3">Total direct impact</th></tr>
<tr><td colspan="2">Total direct impact on UK commercial fishing</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:

<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.067</td></tr>
<tr><td>GVA affected</td><td>0.000</td><td>0.028</td></tr>
</table>
</td></tr>
</table>

Table 2a. Commercial fisheries	**rMCZ South of the Isles of Scilly**
Impact on non-UK commercial fishing: Non-UK vessels using static gears, mid-water trawls and, more commonly, bottom trawls/dredges fish within the rMCZ (Lee, 2010). There are 14 French vessels of over 15 metres that bottom trawl in the rMCZ for species including ray, squid, cuttlefish, pollack and bass (Basse Normandie, pers. comm., 2011). They fish in the rMCZ year-round. Rising fuel costs have resulted in an increase in activity by these boats in the wider south-west region (Basse Normandie, pers. comm., 2011). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.045m/yr; static gears: <£0.001m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.	***Scenario 1:*** No impacts are anticipated under Scenario 1. ***Scenario 2:*** Non-UK vessels using static gear and bottom trawls/dredges, including 14 French bottom trawlers, would be affected by the rMCZ. The estimated value of French landings affected would be £0.045m/yr (bottom trawls/dredges) and <£0.001m/yr (static gears). No information on the effect on other non-UK vessels is available.

Table 2b. National defence	**rMCZ South of the Isles of Scilly**
Source of costs of the rMCZ Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities, including practice firing. The rMCZ is in an MOD exercise area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this rMCZ alone).

Table 2c. Renewable energy **rMCZ South of the Isles of Scilly**

Source of costs of the rMCZ

Management scenario 1: Increase in costs of assessing environmental impacts for licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline).

Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and increase in cable protection costs for power export cables and inter-array cables (relative to the mitigation provided in the baseline).

Baseline description of activity

Wave energy: The rMCZ overlaps with the Isles of Scilly wave energy Potential Development Area (PDA) (PMSS, 2010). Any likely installation could have a footprint within the PDA of 40km^2, covering 1.6% of the PDA (PMSS, 2010). The rMCZ covers 2.7% of the PDA. As the location of the potential installation is not known, the possible overlap of the electricity generating devices, inter-array and export cables with the rMCZ is also not known. One potential energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015–20 (Department of Energy and Climate Change [DECC], pers. comm., 2011). The development in the PDA is expected to have a production capacity of 400MW by 2030 (PMSS, 2010).

Costs of impact of rMCZ on the sector

Wave energy: The estimated cost to wave energy developers of this rMCZ is expected to fall within the following range of scenarios:

£m (one-off cost)	Scenario 1	Scenario 2
Cost to the operator	0.012	At least 0.012

Scenario 1: The analysis assumes that the potential future tidal energy installation is planned within, or within close proximity to, the rMCZ. As a result of the designation of the rMCZ, the potential licence application for the wave energy installation will need to consider the possible effects of the construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.012m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex N for details).

Scenario 2: In addition to the costs set out under scenario 1, further costs may occur under Scenario 2. The mitigation requires the use of alternative cable protection for export and inter-array cables that have not yet been consented. As the actual location of the potential installation is unknown, it is unclear whether any cables will be sought that pass through the rMCZ, and if they are what length of cable may be affected. The cost of this mitigation measure is estimated to be £1m/km of cable (average of wind energy developers; see Annex H14 for details) and as such the total mitigation cost could be significant.

The likelihood and magnitude of any additional costs cannot be calculated. However, JNCC and Natural England (pers. comm., 2012) state that the likelihood of this mitigation being

Table 2c. Renewable energy	rMCZ South of the Isles of Scilly
	required is very low. Further details are provided in Annex H14. The impacts that are assessed in both scenarios are based on JNCC and Natural England's advice on the mitigation that could be required.

Table 2d. Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ South of the Isles of Scilly
Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and telecom cables are assessed in the Evidence Base, Annex H3 and Annex N3 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ South of the Isles of Scilly
Cables (existing interconnectors and telecom cables), commercial fishing (pots & traps, nets),	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ South of the Isles of Scilly**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2011). The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when in unfavourable condition (see Table 1b). A description of on-site fishing activity and the value derived from it is set out in Table 2a.	If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2a. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks. However, as most of the commercial species targeted by fishers in this area are mobile finfish, it is unclear whether the scale of habitat recovered and the magnitude of reduced (on-site) harvesting will be enough to have any significant positive impact on commercial stocks.	Anticipated direction of change: ⟺ Confidence: Low

Table 4b. Recreation		**rMCZ South of the Isles of Scilly**
Baseline	**Beneficial impact**	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education	**rMCZ South of the Isles of Scilly**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out in the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services	**rMCZ South of the Isles of Scilly**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012).	If the conservation objectives are achieved the features will be recovered to favourable condition. Improved habitat condition and a potential reduction in anthropogenic pressures, including from bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the	Anticipated direction of change: ⇧

Table 4d. Regulating services		**rMCZ South of the Isles of Scilly**
Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore it is unlikely to contribute to providing natural hazard protection. It has not been possible to estimate the value of regulating services in the site.	site habitats.	Confidence: Low

Table 4e. Non-use and option values		**rMCZ South of the Isles of Scilly**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: Confidence: Moderate

rMCZ South-East of Falmouth

Site area (km^2): 25.0

Table 1. Conservation impacts				**rMCZ South-East of Falmouth**
1a. Ecological description				
The site's sea bed is approximately 70 metres below chart datum. The site is located in an area of seasonal frontal systems, which means that the area has high productivity and scores highly as an area of additional ecological (pelagic) importance (Lieberknecht and others, 2011).				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
Subtidal coarse sediment	24.34	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	0.69	-	Unfavourable Condition	Recover to Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage	**rMCZ South-East of Falmouth**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Features of archaeological interest are recorded in the site (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known so no overall cost to

Table 2a. Archaeological heritage	**rMCZ South-East of Falmouth**
Source of costs of the rMCZ	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
	the sector of this rMCZ has been estimated. However, the additional cost in one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.

Table 2b. Commercial fisheries	**rMCZ South-East of Falmouth**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment which reflect this uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range. ***Management scenario 1:*** No additional management. ***Management scenario 2:*** Closure of entire rMCZ to bottom trawls and dredges.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Overview: Almost all of the rMCZ is outside the 12nm (nautical mile) limit. A number of fisheries restrictions apply in the area (see Annex E). A wide variety of fishing activity occurs in and around the rMCZ, which can result in gear conflict problems. There is a 'gentlemen's agreement' between static and mobile gear fishers, particularly netters and French trawlers, which enables static gear to be used at neap tides without risk of gear being accidentally towed away (Cornish Fish Producers Organisation, pers. comm., 2010). Bottom trawl and scallop vessels from Cornwall and South Devon fish in the area, as well as nomadic boats and French scallopers and bottom and mid-water trawlers. Tangle nets are used in the rMCZ targeting brill, turbot and ray, wreck nets are deployed targeting pollack, cod and ling (for which there may be specific marks within the site) and there is some hand lining, principally for bass and mackerel (Cornwall Inland Fisheries and Conservation Authority, pers. comm., 2010). Estimated total value of UK vessel landings from the rMCZ: £0.031m/yr.	

Table 2b. Commercial fisheries **rMCZ South-East of Falmouth**

UK Dredges: The rMCZ is located in the southern part of one of the most heavily fished scalloping areas in the South West (MCZ Fisheries Model). The area is primarily fished by larger vessels; however, in recent years larger scallop vessels have concentrated fishing effort in the eastern channel where scallop recruitment has been exceptional (Scallop vessel owner, pers. comm., 2011; Defra, 2011). A proposed new English Scallop Order (Defra, 2011) is expected to result in the exclusion of larger vessels from fishing inside 12nm (Scallop vessel owner, pers. comms., 2011). This is likely to lead to an increase in effort by these larger vessels outside 12nm, including within the rMCZ (Scallop vessel owner, pers. comm., 2011).

Smaller scallop dredgers tend to avoid areas fished by larger vessels as such areas quickly become unviable for them and as such the concentration of their effort is north of the rMCZ, closer inshore (Scallop dredge skipper, pers. comm., 2011).

Estimated value of UK dredge landings from the rMCZ: £0.003m/yr.

A number of fisheries representatives have indicated that fishing effort is high in the rMCZ (Scallop dredge skipper, pers. comm., 2011; Scallop vessel owner, pers. comm., 2011; South West Fishing Industry Group, 2011). Given this, the value of landings estimate may potentially be an underestimate

As scalloping is carried out on a cyclical basis, it is possible that higher levels of effort and associated landings may occur in the rMCZ in future years. This may particularly be the case when larger vessels return from the eastern channel, where scalloping effort has been very high in recent years as a result of increased scallop abundance in the area. In addition, the proposed English Scallop Order (Defra, 2011) may result in increased effort in the rMCZ by larger vessels (as the site is outside 12nm) which would increase the value of landings from the rMCZ.

Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: The modelled estimate of value of landings from the rMCZ indicates a low level of dredging in the rMCZ, although this is contradicted by information provided in discussions with fishers and fisheries representatives. The value of landings from the rMCZ may increase in the future as a result of the potential English Scallop Order and a redistribution of effort from the eastern Channel. It has not been possible to estimate the extent of this potential increase. The closure will remove a potential fishing ground option from the fleet.

The estimate of value of landings affected suggests that the level of displaced effort from the rMCZ will be low. Gear conflict may intensify in the areas surrounding the rMCZ as a result of displaced effort (Cornwall IFCA, pers. comm., 2010; South West Fishing Industry Group, 2011). This may threaten the continuation of the existing gentlemen's agreement between static and mobile gear fishers and ultimately affect a larger value of landings than that identified above (South West Fishing Industry Group, 2011). However, based on the value of landings affected estimate, any affects on gear conflict are likely to be minimal.

Estimated annual value of UK dredge landings affected is expected to fall within the following range (the upper end of this range may be an underestimate):

£m/yr	Scenario 1	Scenario 2
Value of landings affected	0.000	0.003

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ South-East of Falmouth</th></tr>
<tr><td colspan="2">Bottom trawls: The rMCZ is located in the western part of intensively fished beam trawl ground and on the southern edge of an otter trawl ground (MCZ Fisheries Model). Fishing activity by both beam trawlers and otter trawlers occurs year-round. The rMCZ and the area to its north and east are particularly important during winter months when bad weather often prohibits fishing in grounds further west (Beam trawl skipper and otter trawl skipper, pers. comms., 2011).

Trawlers in the area tend to tow with the wind, which is a prevailing south-westerly (Beam trawl skipper and otter trawl skipper, pers. comms., 2011). Beam trawlers principally target monkfish, cuttlefish and sole while otter trawl vessels target a mix of species including lemon sole, red mullet and squid.

Estimated value of UK bottom trawl landings from the rMCZ: £0.018m/yr.

A number of representatives have indicated that fishing effort is very high within this rMCZ (Beam trawl skipper, pers. comm., 2011; otter trawl skipper, pers. comm., 2011; South West Fish Producers Organisation, pers. comm., 2010; Cornwall IFCA, pers. comm., 2010; South West Fishing Industry Group, 2011). Given this evidence, the value of landings estimate may potentially be an underestimate.</td><td>Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: In response to this management scenario, displacement of effort by vessels that bottom trawl in the rMCZ may increase effort in the surrounding fisheries. In particular, during periods of bad weather fishers will increase effort to the north and east of the rMCZ (Beam trawl skipper and otter trawl skipper, pers. comms., 2011). Increased effort in the remaining fishing ground may affect catch rates. Given the importance of the wider fishing ground during bad weather, the impact of the rMCZ is likely to be more heavily felt during the winter when fishing options are reduced. If as a result fishers choose to target alternative grounds that do not offer the same shelter then their safety is likely to be put at greater risk (South West Fishing Industry Group, 2011).

Gear conflict may intensify in the areas surrounding the rMCZ as a result of displacement. This could arise if, for example, displaced trawlers increase effort in the area outside the rMCZ and static gear fishers do not transfer their effortinto the rMCZ and maintain their levels of effort outside it (Cornwall IFCA, pers. comm., 2010; South West Fishing Industry Group, 2011). This may threaten the continuation of the existing gentlemen's agreement between static and mobile gear fishers and ultimately affect a larger value of landings than that identified above (South West Fishing Industry Group, 2011).

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range (the upper end of this range may be an underestimate):

<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.018</td></tr>
</table>
</td></tr>
<tr><th colspan="3">Total direct impact</th></tr>
<tr><td colspan="2">Total direct impact on UK commercial fishing</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:

<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.021</td></tr>
</table>
</td></tr>
</table>

Table 2b. Commercial fisheries	**rMCZ South-East of Falmouth**
	GVA affected: 0.000 – 0.009
Impact on non-UK commercial fishing: Non-UK vessels using bottom trawls/dredges, static gears and mid-water trawls fish within the rMCZ (Lee, 2010). This includes 14 French vessels of over 15 metres that bottom trawl in the rMCZ for species including ray, squid, cuttlefish, pollack and bass (Basse Normandie, pers. comm., 2011). They fish in the rMCZ year-round. Rising fuel costs have resulted in an increase in activity by these boats in the wider south-west region (Basse Normandie, pers. comm., 2011). Estimated value of landings from the pMCZ by French vessels: bottom trawls/dredges: £0.076m/yr; static gears: £0.007m/yr. Estimates for other countries are not available.	***Scenario 1:*** No impacts are anticipated under Scenario 1. ***Scenario 2:*** Non-UK vessels using bottom trawls/dredges, including 14 French bottom trawlers, would be affected by the rMCZ. The estimated value of French landings affected would be £0.076m/yr (bottom trawls/dredges). No information on the effect on other non-UK vessels is available.

Table 2c. National defence	**rMCZ South-East of Falmouth**
Source of costs of the rMCZ Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities, including practice firing. The rMCZ is in an MOD danger area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this rMCZ alone).

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ South-East of Falmouth**
Commercial fishing (mid-water trawls, pots & traps, nets, hooks & lines),	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ South-East of Falmouth**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2011). The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when in unfavourable condition (see Table 1b). A description of on-site fishing activity and the value derived from it is set out in Table 2b.	If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks. As the rMCZ is relatively small it is unclear whether it would have any impact on stocks of mobile commercial finfish species. Low mobility and site-attached species populations, such as crab and crawfish, may improve as a result of reduced fishing pressure. Localised beneficial spill-over	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ South-East of Falmouth**
	effects may occur around the rMCZ. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits. If MCZ management involves reduced mobile gear effort, but no reductions in static gear fishing, this may reduce gear conflict between mobile and static gear fishers. Reduced gear conflict may reduce the cost of fishing in the rMCZ for static gear fishers. The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	

Table 4b. Recreation		**rMCZ South-East of Falmouth**
Baseline	**Beneficial impact**	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education		**rMCZ South-East of Falmouth**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out in the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧

Table 4c. Research and education		**rMCZ South-East of Falmouth**
		Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ South-East of Falmouth**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore it is unlikely to contribute to providing natural hazard protection.	If the conservation objectives are achieved the features will be recovered to favourable condition. Improved habitat condition and a potential reduction in anthropogenic pressures, including from bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services	**rMCZ South-East of Falmouth**	
It has not been possible to estimate the value of regulating services in the site.		

Table 4e. Non-use and option values	**rMCZ South-East of Falmouth**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change:  Confidence: Moderate

rMCZ Reference Area South-East of Portland Bill

Site area (km^2): 0.25

Table 1. Conservation impacts				**rMCZ Reference Area South-East of Portland Bill**
1a. Ecological Description				
The recommended Marine Conservation Zone (rMCZ) sits within the boundary of the Studland to Portland draft Special Area of Conservation. The rMCZ Reference Area just covers an area of blue mussel beds. The depth of the site ranges from 30 to 35 metres, and it is located 4km south-east of Portland Bill (Lieberknecht and others, 2011).				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
High energy circalittoral rock	0.25	-	Unfavourable Condition	Recover to Reference Condition
Habitats of Conservation Importance				
Blue mussel beds	0.24	-	Unfavourable Condition	Recover to Reference Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Commercial fisheries	**rMCZ Reference Area South-East of Portland Bill**
Source of costs of the rMCZ	
Management scenario 1: Closure of rMCZ to all commercial fishing.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Overview: The rMCZ is situated inside the 6nm (nautical mile) limit and as such is subject to a number of existing fisheries restrictions (see Annex E). The Studland to Portland candidate SAC (cSAC), which the rMCZ is wholly within, may result in new management of commercial fishing activities in the area. The main activity taking place within the rMCZ is dredging for seed mussel, which occurs under licence from the Inland Fisheries and Conservation Authority (IFCA). There is very limited activity using	

Table 2a. Commercial fisheries **rMCZ Reference Area South-East of Portland Bill**

other gear types and there is not thought to be any mid-water trawl activity. Estimated total value of UK vessel landings from the rMCZ: £0.010m/yr.

UK Dredges: The rMCZ covers part of an area of dense mussel beds. The area is fished by a single operator, with annual permission granted by the Southern IFCA, which dredges mussel seed from the rMCZ and relays it inside Poole Harbour, outside the rMCZ. The operator works two distinct areas of the mussel beds and the rMCZ covers approximately 12.5% of one of these areas; and 5% of the combined area of both areas.

It is anticipated that the management of the Studland to Portland cSAC will not involve closure to seed mussel dredging and that no additional information will be required for the formal Appropriate Assessment for the seed mussel dredging operations (Natural England personal communication, 2012).

As the mussel seed is re-laid and not landed, it is not recorded in the Marine Management Organisation's iFISH database, and therefore value of landings estimates from the MCZ Fisheries Model are not available for the fishery. Based on the value of mussel seed removed from the two areas in 2010 (provided by the Southern IFCA), and assuming that the value of dredging is uniform across them, it is estimated that, if sold, the value of UK dredge landings from the rMCZ would be £0.010m/yr.

The mussel seed is grown on in Poole Harbour by a company from the same group. Based on the parent company turnover (Oakford Oysters Ltd, pers. comm., 2012), and assuming a 5% reduction (in line with the proportion of the dredged areas that may be closed), the full value (including the indirect impact on the mussel cultivation business) potentially affected by rMCZ is estimated to be £0.035m/yr.

Scenario 1: The rMCZ would remove approximately 12.5% of one of the two distinct areas currently dredged for mussel seed; 5% of the total area that is dredged. A buffer zone around the rMCZ is not likely to be required as dredging occurs over a tide-swept biotope and any sedimentation is therefore likely to be minimal and its effects short lived (Natural England, pers. comm., 2012).

Estimated annual value of UK dredge landings affected:

£m/yr	Scenario 1
Value of landings affected	0.010

The total area used for mussel seed dredging is relatively small, and the scope for altering the shape of the dredged areas may be limited if agreement for continuation of dredging in the SAC has been reached. Consequently, it may not be possible for the operator to recoup landings lost to the rMCZ from elsewhere in the vicinity. This would also impact on the operator's downstream mussel seed cultivation business, which grows on the harvested seed, resulting in a loss of approximately £0.035m/yr turnover (as this is considered an indirect impact, this figure has not been included in the headline impact calculations).

<table>
<tr><th colspan="2">Table 2a. Commercial fisheries</th><th>rMCZ Reference Area South-East of Portland Bill</th></tr>
<tr><td colspan="2">UK Pots and traps: There is not thought to be a significant level of potting within the rMCZ. However, recent survey work by the Southern IFCA has identified strings of pots within the wider area. Estimated value of UK pot and trap landings from the rMCZ: less than £0.001m/yr.</td><td>Scenario 1: Given the very low level of activity, no significant impacts are expected.
Estimated annual value of UK pot and trap landings affected:
<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001</td></tr></table></td></tr>
<tr><th colspan="3">Total direct impact</th></tr>
<tr><td colspan="2">Total direct impact on UK commercial fishing</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected:
<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.010</td></tr><tr><td>GVA affected</td><td>0.005</td></tr></table></td></tr>
<tr><td colspan="2">Impact on non-UK commercial fishing</td><td>None.</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Recreation</th><th>rMCZ Reference Area South-East of Portland Bill</th></tr>
<tr><td colspan="3">Source of costs of the rMCZ
Recreational angling management scenario: Closure of the rMCZ to recreational angling and anchoring of vessels (except in emergency).</td></tr>
<tr><th colspan="2">Baseline description of activity</th><th>Costs of impact of rMCZ on the sector</th></tr>
<tr><td colspan="2">Angling: The area off Portland Bill, which includes the pMCZ is a popular site for catching bream, cod, mackerel, bull huss, undulate ray, bass, conger eel, plaice and pouting (Weymouth & Portland Licensed Skippers Association, 2011).
A number of local angling charter boats (between 20 and 30 boats depending</td><td>The rMCZ is relatively small but it is within a popular fishing area and angling trips and catches would be expected to be affected by its closure as they would no longer be able to fish within the area of the rMCZ. However, charter skippers expect to be able to continue to have successful angling trips to the area as the rMCZ only covers only a small proportion of the wider area that is visited (Weymouth and Portland Licensed Skippers Association,</td></tr>
</table>

Table 2b. Recreation	**rMCZ Reference Area South-East of Portland Bill**
Source of costs of the rMCZ	
Recreational angling management scenario: Closure of the rMCZ to recreational angling and anchoring of vessels (except in emergency).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
on the tide) visit the wider area around the pMCZ. Approximately 14,400 paying passengers a year use the angling boats, although some are repeat visitors (Weymouth & Portland Licensed Skippers Association, 2011). Some private boat anglers are also likely to visit the area, although numbers are not known (Weymouth & Portland Licensed Skippers Association, 2011). . The South-East Portland pMCZ is one of many sites that are visited during a typical angling trip. As the pMCZ is relatively small, angling may not occur inside it on every angling trip to the Portland Bill area. (Weymouth & Portland Licensed Skippers Association, 2011).	2011). It is thought that the closure of the rMCZ to angling will not affect people's propensity to go angling in the wider area and no significant costs to participants or charter boat operators are expected (Weymouth and Portland Licensed Skippers Association, 2011).

Table 2c. Renewable energy	**rMCZ Reference Area South-East of Portland Bill**
Source of costs of the rMCZ	
Management scenario 1: Installation of renewable energy devices and cables not permitted within the rMCZ. Increase in costs of assessing environmental impacts for licence applications within 1km of the rMCZ (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Tidal energy: The rMCZ overlaps with the Portland tidal energy Potential Development Area (PDA) (PMSS, 2010). Any installation could have a footprint within the PDA of 5km^2, equivalent to less than 0.1% of the PDA. The rMCZ covers virtually all of the best tidal stream energy resource in the area and therefore overlaps with the most likely preferred location for an	***Tidal energy:*** The estimated cost to tidal energy developers of this rMCZ is expected to fall within the following range of scenarios: *£m (one-off cost)* — Scenario 1 Cost to the operator — At least 0.011

Table 2c. Renewable energy	**rMCZ Reference Area South-East of Portland Bill**
installation. One energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015–20 (Department of Energy and Climate Change [DECC], pers. comm., 2011). The development in the PDA is expected to have a production capacity of 120MW by 2030 (PMSS, 2010).	As development would not be permitted within the rMCZ, as it is an rMCZ Reference Area, it may not be possible for the devices that generate electricity to be situated in the best area of tidal energy resource. Information provided in PMSS (2011) indicates that use of the next best tidal resource in the PDA may result in a 5-year delay to the time at which tidal energy generation becomes feasible, as more efficient energy generation technology will be required. This will therefore result in a 5-year delay to the potential benefit stream associated with the Portland PDA. It is assumed that the future installation will go ahead within close proximity (less than 1km) to the rMCZ, which is where the next best areas of tidal energy resource in the PDA are. Because of the rMCZ, the potential licence application for the tidal energy installation will need to consider the potential effects of the construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.011m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex N for details). Further costs may occur if re-routing of export cables around the rMCZ is required. As the actual location of the potential installation and associated cable routes are unknown, it is unclear whether any export cables will need to be re-routed around the rMCZ. The rMCZ is small (0.25km2) so any diversion is likely to result in no more than around 1km of additional cable. However, the cost of this mitigation measure is estimated to be £1.01m/km of cable (average of wind energy developer estimates, see Annex H14 method paper for details) and as such the total mitigation cost could be significant. The likelihood and magnitude of any additional costs cannot be calculated.

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ Reference Area South-East of Portland Bill**
None.	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ Reference Area South-East of Portland Bill**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Circalittoral rock is the predominant habitat in the rMCZ, and provides a firm substrate for species attachment and important inshore crab and lobster fisheries (Fletcher and others, 2011). Mussels are a commercial species which is currently targeted in and around the rMCZ. The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition. A description of on-site fishing activity and the value derived from it is set out in Table 2a.	If the conservation objectives of the features are achieved, they will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ. The costs of this are set out in Table 2a. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ will reduce the on-site fishing mortality of species which may benefit commercial stocks. As the rMCZ is small it is unclear whether it would have any impact on stocks of mobile commercial finfish species. Management prohibiting dredging for seed mussel may result in an improvement in the condition of the mussel	Anticipated direction of change: ⇔ Confidence: Low

Table 4a. Fish and shellfish for human consumption	**rMCZ Reference Area South-East of Portland Bill**	
	beds. As no fishing will be permitted within the rMCZ, no on-site benefits will be realised. Benefits may arise as a result of increased spill-over of fish larvae, juveniles and adults to areas outside the rMCZ, although there is no known evidence of this currently.	

Table 4b. Recreation	**rMCZ Reference Area South-East of Portland Bill**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by features of the site when not in reference condition (see Table 1b). A description of on-site angling activity is set out in Table 2b. It has not been possible to estimate the value of angling at the site.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to management of commercial fishing (see Table 4a). As angling will not be permitted within the rMCZ, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers. Such benefits may be insignificant.	Anticipated direction of change: ⟺ Confidence: Low
Diving: Diving is not known to take place in the rMCZ	N/A	N/A
Wildlife watching: Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. An improvement in the condition of site features and any associated increase in abundance and diversity of species that are visible to wildlife watchers may improve the quality of wildlife watching at the site and	Anticipated direction of change: ⇧

Table 4b. Recreation	**rMCZ Reference Area South-East of Portland Bill**	
The Portland Bill area is rich with wildlife. Alongside many different species of birds, dolphins and whales can be spotted in the area. The lighthouse at Portland Bill houses a bird observatory. Local companies offer boat trips for visitors to experience the wildlife. It has not been possible to estimate the value of wildlife watching in the rMCZ.	therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK wildlife watching visits	Confidence: Low

Table 4c. Research and education	**rMCZ Reference Area South-East of Portland Bill**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. The rMCZ overlaps a Special Area of Conservation and an area licensed for dredging of mussel seed. Research has been undertaken in relation to both of these, including survey work by the Southern Inland Fisheries and Conservation Authority. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	As an rMCZ Reference Area, the rMCZ will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures**.** It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services	**rMCZ Reference Area South-East of Portland Bill**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Blue mussel beds play an important role in the regulation of pollution and water purification (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Blue mussel beds create biogenic structurally complex habitats that provide refuge for a range of flora and fauna, and rock habitats can support particularly high biodiversity (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore, its features are not thought to contribute to the delivery of this service. It has not been possible to estimate the value of regulating services in the site.	If the conservation objectives of the features are achieved the features will be recovered to reference condition. Improved habitat condition and a reduction in anthropogenic pressures, including the use of bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ Reference Area South-East of Portland Bill**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the MCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4e. Non-use and option values	**rMCZ Reference Area South-East of Portland Bill**	
	the future, from past degradation and the risk of future degradation.	

rMCZ South-West Deeps (East) Site area (km^2): 5,808.61

Table 1. Conservation impacts				**rMCZ South-West Deeps (East)**
1a. Ecological description				
The site comprises an area of continental shelf sea where the sea-floor habitat is dominated by subtidal mixed sediment and subtidal sand, and a section of the continental shelf break in the far south-west corner. The eastern site boundary is approximately 170km south-west of Land's End. The depth of the site is between 100 and 200 metres on the shelf, and between 200 and 1,000 metres in the far south-west corner (on the shelf break). The site is crossed by Celtic Sea relict sandbanks in a north-east to south-west direction (these sandbanks are listed as a geological/geomorphological interest feature in the Ecological Network Guidance) (Lieberknech and others, 2011).				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	**Area of feature (km2)**	**No. of point records**	**Baseline**	**Impact of MCZ**
Broad-scale Habitats				
Subtidal coarse sediment	1747.24	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	3934.32	-	Favourable Condition	Maintained at Favourable Condition
Deep sea bed	126.73	-	Unfavourable Condition	Recover to Favourable Condition
Geological and Geomorphological Features of Interest				
Celtic sea relict sandbanks	417.63	-	Favourable Condition	Maintained at Favourable Condition

Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)

Table 2a. Commercial fisheries	**rMCZ South-West Deeps (East)**
Source of costs of the rMCZ	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Multiple management scenarios have been identified for the Impact Assessment which reflect this	

Table 2a. Commercial fisheries	**rMCZ South-West Deeps (East)**
uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range. ***Management scenario 1:*** No additional management. ***Management scenario 2:*** Zoned closure of areas of deep-sea bed and sub-tidal coarse sediment in the rMCZ to bottom trawls and dredges. ***Management scenario 3:*** Zoned closure of areas of deep-sea bed and sub-tidal coarse sediment in the rMCZ to bottom trawls and dredges; zoned closure of area of deep-sea bed in the rMCZ to pots and traps, nets, and hooks and lines. ***Management scenario 4:*** Closure of entire rMCZ to bottom trawls and dredges. ***Management scenario 5:*** Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, and hooks and lines.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Overview: The rMCZ is close to the south-western edge of the UK's 200nm (nautical mile) fishery limit and the UK's exclusive economic zone. It spans parts of 7 ICES Rectangles (27E1, 27E2, 26E1, 26E2, 25E0, 25E1). UK, French and Spanish vessels are active throughout most of the ICES Rectangles (MMO, 2011a). UK fleet activity in the rMCZ is predominantly beam trawling by Newlyn vessels of over 25 metres and their fishing effort is concentrated in the eastern edge of the rMCZ (MCZ Fisheries Model). UK and French otter trawls fish in the central and northern parts of the rMCZ (MCZ Fisheries Model; Lee, 2010). There is long lining in the south-western parts of the rMCZ over the shelf break by UK and Spanish vessels, as well as low levels of netting and mid-water trawling by UK and non-UK vessels (MCZ Fisheries Model; Lee, 2010; MMO, 2011a). No dredging currently occurs in the rMCZ, although the site may overlap with a historical scallop fishery. Estimated total value of UK vessel landings from the rMCZ: £0.097m/yr.	
UK Dredges: There has not been any UK dredging activity within the rMCZ or in the 7 ICES Rectangles that overlap the rMCZ over the last 4 years (MMO, 2011a). Discussion with fishers provided mixed views as to whether or not the rMCZ covers a historical scallop fishery. One view is that the fishery runs down sandbanks (Scallop vessel owner, pers. comm., 2011) that cross the eastern half of the rMCZ roughly in a north-east to south-west direction. Another view is that the area is generally too deep for scalloping (Scallop vessel skipper, pers. comm., 2011). Estimated value of UK dredge landings from the rMCZ: £0.000m/yr.	***Scenario 1:*** No impacts are anticipated under Scenario 1. ***Scenarios 2 and 3:*** Based on the modelled value of landings data (MCZ Fisheries Model), no impacts are expected to dredges. However, the sandbanks that are thought to have been historically targeted by scallopers run through both the sub-tidal sand and sub-tidal coarse sediment in the rMCZ. If the area is a historical scallop fishery then these management scenarios would remove a part of a potential fishing ground that large vessels might otherwise have fished in the future. ***Scenarios 4 and 5:*** Based on the modelled value of landings data (MCZ Fisheries Model),

Table 2a. Commercial fisheries **rMCZ South-West Deeps (East)**

As scalloping is carried out on a cyclical basis it is expected that, despite the low level of activity in the last 4 years, if the fishery is a historical ground, it may be targeted again in future years (Scallop dredge owner, pers. comm., 2011). This may particularly be the case when larger vessels return from the eastern channel, where scalloping effort has been very high in recent years as a result of increased scallop abundance in the area (Defra, 2011). This may result in higher annual landings from the rMCZ.

no impacts are expected to dredges. However, if the area is a historical scallop fishery then these management scenarios would remove a potential fishing ground that large vessels might otherwise have fished in the future.

Estimated annual value of UK dredge landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Value of landings affected	0.000	0.000	0.000	0.000	0.000

UK Bottom trawls: UK bottom trawl activity, by both beam trawls and otter trawls, occurs throughout the rMCZ.

Large beam trawlers, typically Newlyn-based vessels of over 25 metres in length with beams of up to 10 metres, target species including megrim and monkfish in the wider south-west deeps area (Beam trawl owner, pers. comm., 2011; MMO, 2011a). Beam trawlers typically tow in a south-west to north-east direction, following the line of the sandbanks (South West Fishing Industry Group, 2011; Beam trawl owner, pers. comm., 2011). The sandbanks are concentrated in the eastern half of the rMCZ and run in roughly a north-east to south-west direction, and beam trawling effort in the rMCZ is correspondingly concentrated in the eastern part, east of the 8 degree line. This is the western edge of an area of activity that extends eastwards to the western channel.

There is evidence of Newlyn beam trawlers spending up to 36 days a year fishing in ICES Rectangles 26E2 and 27E2, which the rMCZ overlaps (Mamza, 2011). Data on activity that is specific to the rMCZ area is not available.

UK otter trawl activity is concentrated in the northern and far south-western part of the rMCZ (MCZ Fisheries Model). The vessels target a large area running north of the rMCZ up towards the south-west coast of Ireland. The

Scenario 1: No impacts are anticipated under Scenario 1.

Scenarios 2 and 3: Beam trawl activity is concentrated in the east of the rMCZ over the area of sub-tidal coarse sediment, within the zoned area. As such, Scenario 2 is expected to result in the same impacts as those described below for scenarios 4 and 5.

Otter trawl activity is concentrated in the north and west of the rMCZ, outside the zoned area, with a relatively lower intensity occurring within the zoned area. Otter trawl effort displaced from the rMCZ may result in increased effort in the area to the north of the rMCZ. The rMCZ is situated at the southern edge of a fishery that extends up towards southern Ireland (MMO, 2011a).

Scenarios 4 and 5: In these scenarios, beam trawl effort displaced from the rMCZ may result in increased effort in the area to the more heavily fished area to the east of the rMCZ. However, fisheries representatives could not say with any certainty how the rMCZ may affect the fishing patterns of the affected vessels, in particular where or if they might seek to increase fishing effort to compensate for the rMCZ closure. The rMCZ is situated at the western edge of a fishing ground that spans at least 100nm (nautical miles) (MCZ Fisheries Model), and with a typical beam trawl tow covering approximately 7nm (Beam trawl owner, pers. comm., 2011) the rMCZ would not be expected to significantly influence the pattern of fishing in the area to the east of the rMCZ.

Otter trawl effort displaced from the rMCZ may result in increased effort in the area to the

<table>
<tr><th>Table 2a. Commercial fisheries</th><th>rMCZ South-West Deeps (East)</th></tr>
<tr><td>area is principally fished by otter trawl vessels of between 30 and 40 metres targeting megrim, monkfish and angler fish (MMO, 2011a).

Estimated value of UK bottom trawl landings from the rMCZ: £0.090m/yr.</td><td>north of the rMCZ. The rMCZ is situated at the southern end of a fishery that extends up towards southern Ireland (MMO, 2011a).

The displacement of bottom trawl vessels may have knock on consequences on fishing outside the rMCZ.

Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:

<table>
<tr><th>£m/yr</th><th>Scenario 1</th><th>Scenario 2</th><th>Scenario 3</th><th>Scenario 4</th><th>Scenario 5</th></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.049</td><td>0.049</td><td>0.090</td><td>0.090</td></tr>
</table>
</td></tr>
<tr><td>UK Nets: There is a low level of gill netting in the rMCZ by vessels of between 15 and 30 metres in length. Activity is concentrated in the north-east and south-west corners of the rMCZ. Estimated value of UK net landings from the rMCZ: £0.003m/yr.</td><td>Scenarios 1, 2, 3 and 4: No impacts are anticipated under these scenarios.

Scenario 5: The level of netting in the rMCZ is low, as indicated by the value of landings from it, and as such no significant impacts are anticipated under this scenario.

Estimated annual value of UK net landings affected is expected to fall within the following range:

<table>
<tr><th>£m/yr</th><th>Scenario 1</th><th>Scenario 2</th><th>Scenario 3</th><th>Scenario 4</th><th>Scenario 5</th></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.000</td><td>0.000</td><td>0.003</td></tr>
</table>

In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with nets at current levels. Where this is the case, this activity was not the primary reason for assigning 'recover' conservation objective(s). As such, it is anticipated that if management is required it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.</td></tr>
</table>

Table 2a. Commercial fisheries — **rMCZ South-West Deeps (East)**

UK Hooks and lines: There is a low level of set long lining in the rMCZ. Activity is concentrated in the north-east and south-west corners of the rMCZ. Estimated value of UK hook and line landings from the rMCZ: £0.003m/yr.

Scenarios 1, 2 and 4: No impacts are anticipated under these scenarios.

Scenarios 3 and 5: The level of fishing with hooks and lines in the rMCZ is low, as indicated by the value of landings from it, and as such no significant impacts are anticipated under these scenarios.

Estimated annual value of UK hook and line landings affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Value of landings affected	0.000	0.000	<0.001	0.000	0.003

In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with hooks and lines at current levels. Where this is the case, this activity was not the primary reason for assigning 'recover' conservation objective(s). As such, it is anticipated that if management is required it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.

Total direct impact

Total direct impact on UK commercial fishing

Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:

£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Value of landings affected	0.000	0.049	0.049	0.090	0.095
GVA affected	0.000	0.020	0.021	0.038	0.040

Impact on non-UK commercial fishing: Non-UK vessels using bottom trawls/dredges, mid-water trawls and static gears fish within the rMCZ (Lee,

Scenario 1: No impacts are anticipated under Scenario 1.

Table 2a. Commercial fisheries	**rMCZ South-West Deeps (East)**
2010). Spanish long lines recorded an estimated 240 fishing days within the rMCZ in 2010, and Spanish bottom trawlers an estimated 1,000 fishing days (ANASOL, OPPAO, OPP-7 and Puerto de Caleiro, pers. comms., 2011). All Spanish vessels active in the rMCZ are over 24 metres in length. Bottom trawlers typically target hake, megrim and monkfish and longliners target hake (ANASOL, OPPAO, OPP-7 and Puerto de Caleiro, pers. comms., 2011). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £1.235m/yr; static gears: £0.045m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.	***Scenarios 2, 3, 4 and 5:*** Non-UK vessels using static gears, bottom trawls/dredges, in particular French and Spanish demersal trawlers, will be affected by these management scenarios for the rMCZ. It is anticipated that the scenarios would result in the displacement of trawling fishing effort. This may have unknown knock-on impacts (ANASOL, OPPAO, OPP-7 and Puerto de Caleiro, pers. comms., 2011). In the event of a full closure of the rMCZ the estimated value of French landings affected would be £1.235m/yr (bottom trawls/dredges) and £0.045m/yr (static gears). No information on the effect of zoned closures to bottom trawls/dredges and static gears or the impact on Spanish vessels' value of landings is available.

Table 2b. National defence	**rMCZ South-West Deeps (East)**
Source of costs of the rMCZ Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the rMCZ for water column activities. The rMCZ is in an MOD exercise area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this pMCZ alone).

Table 2c. Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ South-West Deeps (East)**
Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and telecom cables are assessed in the Evidence Base, Annex H3 and Annex N3 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ South-West Deeps (East)**
Cables (existing interconnectors and telecom cables); Commercial fishing (mid-water trawls)	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of a range of ecosystem services. Designation of the rMCZ and its subsequent management may improve the quantity and quality of the beneficial services provided, which may increase the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the rMCZ. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ South-West Deeps (East)**
Baseline	**Beneficial impact**	
Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) contribute to the delivery of fish and shellfish services. Offshore sediment habitats support internationally important fish and shellfish fisheries (Fletcher and others, 2011). The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when in favourable and unfavourable condition (see Table 1b). A description of on-site fishing activity and the value derived from it is set out in Table 2a.	If the conservation objectives of the features are achieved, the subtidal coarse sediment and deep-sea habitats will be recovered to favourable condition. The subtidal sand and geological feature will be maintained in favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2a. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks. The rMCZ is large and there is currently a high level of fishing effort. As such, the scale of habitat recovered and the magnitude of reduced (on-site) harvesting may be enough to have a positive impact on commercial stocks. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits. The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-site impacts of displaced effort.	Anticipated direction of change: Confidence: Low

Table 4b. Recreation		**rMCZ South West Deeps (East)**
Baseline	**Beneficial impact**	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 4c. Research and education	**rMCZ South-West Deeps (East)**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services. No known research activities are currently carried out in the rMCZ.	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity is focused on the area of the rMCZ.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services	**rMCZ South-West Deeps (East)**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen. The deep-sea	If the conservation objectives are achieved some of the features will be recovered to favourable condition. Others will be maintained in favourable condition. Improved habitat condition and a potential reduction in anthropogenic	Anticipated direction of change: ⇧

Table 4d. Regulating services		**rMCZ South-West Deeps (East)**
bed acts as an unrivalled reservoir for sequestration of CO_2. Gas and climate regulation provided by the deep sea includes the maintenance of the chemical composition of the atmosphere and the oceans, for example via the 'biological pump', which transports carbon absorbed during photosynthesis into the deep seas. Methanotrophic microbes in the ocean floor and waters control almost all of the oceanic methane emission (Fletcher and others, 2012). ***Environmental resilience:*** The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats (Fletcher and others, 2012). ***Natural hazard protection:*** As the site is offshore it is unlikely to contribute to natural hazard protection. It has not been possible to estimate the value of regulating services in the site.	pressures, including the use of bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats. Designating the recommended Marine Conservation Zone will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Confidence: Low

Table 4e. Non-use and option values		**rMCZ South-West Deeps (East)**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the non-use value of the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an ecologically coherent network of Marine Protected Areas. Some people will gain satisfaction from knowing that the habitats and species are being conserved (existence value) and/or that they are being conserved for use by others in the current generation (altruistic value) or future generations (bequest value). The rMCZ will recover and protect the features and the ecosystem services provided, and thereby the option to benefit from these services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate