

Annex I2 Direct impacts arising from individual rMCZs (Option 1 sites - Finding Sanctuary)

1 Introduction

1.1.1 This annex sets out the direct impacts of each of the Finding Sanctuary recommended Marine Conservation Zones (rMCZs) being proposed **only** for designation in Option 1 of the Impact Assessment.

1.1.2 Four sets of tables are provided for each rMCZ as follows:

- Table 1 – sets out an ecological description of the site, and specifies what ecological features are to be protected by the rMCZ and their conservation objectives;
- Table 2 – sets out the cost impacts of the rMCZ by sector.
- Table 3 – lists the sectors that have activities currently occurring within or near to the rMCZ but for which no mitigation is required and therefore no cost impacts are anticipated.
- Table 4 – sets out the contribution to the Ecological Network Guidance undertaken by the Statutory Nature Conservation Bodies (SNCBs)
- Table 5 – sets out the beneficial impacts to ecosystem services of the rMCZ

2 Impact Assessment

2.1.1 The remainder of this document sets out the individual rMCZ and rMCZ Reference Area assessments.

rMCZ Axe Estuary**Site area (km²): 0.33**

- This site has been proposed for designation under Policy Option 1 only.
- Based on SNCB advice, the draft conservation objective for one feature of this site has been changed from those established by the Regional Projects. The impacts of this change on management and costs are not reflected in this Impact Assessment.

Table 1. Conservation impacts				rMCZ Axe Estuary
1a. Ecological description				
<p>At the mouth of the estuary, the recommended Marine Conservation Zone (rMCZ) overlaps with the Lyme Bay no-tow area. The Lyme Bay to Torbay candidate Special Area of Conservation (SAC) lies just seaward of the site and the River Axe (inland) is designated as an SAC. There are several Sites of Special Scientific Interest on account of the Axe's importance as a river with distinctive communities of floating vegetation.</p> <p>The rMCZ stretches along approximately 2.5km of the Axe Estuary, surrounded mainly by marshes and farmland. There is a small harbour at the mouth of the estuary, sheltered by a shingle bar across the estuary mouth. The estuary is a nursery area for fish (including bass), with the supporting benthic habitats, and has been mapped as an area of higher than average taxonomic distinctness and biotope richness.</p> <p>Along the lower reaches of the river, the mixed catchment geology of sandstones and limestones gives rise to calcareous waters where water crowfoot <i>Ranunculus penicillatus</i> spp. <i>Pseudofluitans</i> dominates, giving way to <i>Ranunculus fluitans</i> further downstream. Short-leaved water-starwort <i>Callitriche truncata</i> is an unusual addition to the <i>Ranunculus</i> community and gives additional interest. The estuary is of ecological importance as it contains mudflats and areas of saltmarsh; it is recognised as supporting high productivity and as a nursery area (Lieberknecht and others, 2011).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km ²)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Coastal saltmarshes and saline reedbeds	0.01	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	< 0.01	-	Favourable Condition	Maintained at Favourable Condition

Table 1. Conservation impacts				rMCZ Axe Estuary
Intertidal mud	0.21	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	0.04	-	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Anguilla anguilla</i>	-	-	Unknown	Unknown
SNCBs advise that the conservation objective for the European eel (<i>Anguilla anguilla</i>) is “Recover”				

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

Table 2a. Flood and coastal erosion risk management (coastal defence)		rMCZ Axe Estuary
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
The 0 to 20 year Shoreline Management Plan policies along landward edges for the rMCZ are: outer estuary: ‘hold the line’; spit: ‘no active intervention’; inner estuary: ‘managed realignment’. The Axe Estuary Wetland scheme is anticipated within the next 5 years and additional 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 2b. Ports, harbours, shipping and disposal sites		rMCZ Axe Estuary	
Source of costs of the rMCZ under Policy Option 1			
Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications. This applies to navigational dredging 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 navigational dredging 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) and implementing new MDPs for ports that do not currently have one in place 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 under Policy Option 1	
<u>Navigational Dredging:</u> Axmouth Harbour is a relatively small drying harbour, used primarily for recreation purposes. Within the rMCZ, annual dredging is required to maintain safe navigation around the harbour and occasional dredging is required of the sand bar at the mouth of the estuary. Licences are required for each dredging operation. For the purposes of the Impact Assessment it is assumed that the licences are for 5-year periods, with the next applications required in 2016 (Axe Yacht Club, pers. comm., 2011).	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.003	0.003*
<u>Harbour development:</u> Axemouth Harbour is situated within the rMCZ boundary. There are no known development plans for the harbour.	*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.		
	Scenario 1: Future licence applications for navigational dredging in Axmouth Harbour will need to consider the potential effects of the dredging on the features protected by the rMCZ and their conservation objectives. This is expected to result in one-off additional costs of approximately £0.014m every 5 years from 2016 (calculated based on 2 licence applications – see Annex N for details).		
	Scenario 2: <u>Navigational dredging:</u> Under scenario 2, one-off costs of £0.014m are expected every five years from 2016, as described for scenario 1 for navigational dredging within the rMCZ. No additional mitigation, beyond that provided in the baseline situation, is anticipated. 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		

Table 2b. Ports, harbours, shipping and disposal sites	rMCZ Axe Estuary
	<p>£0.008m.</p> <p><u>Harbour developments:</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 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.</p>

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 recommended Marine Conservation Zone under Policy Option 1 (rMCZ) (over 2013 to 2032 inclusive)	rMCZ Axe Estuary
Recreation; research and education; water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale¹</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows</p>	rMCZ: Axe Estuary
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¹ copied from the JNCC and Natural England's advice to Defra on rMCZs

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indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.									
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.4 Subtidal mixed sediments	BSH	✓	✓	✓ * 1	None	Maintain			
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	N/A	✓ * 1	None	Maintain			BAP
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓ * 1	None	Maintain			
A2.4 Intertidal mixed sediments	BSH	✓	✓	✓ * 1	None	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	✓ * 1	None	Maintain			BAP and OSPAR
European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	✓	N/A	None	<i>Maintain/ Recover</i> * 2			BAP and OSPAR

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Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓ * ³
Overlaps with existing MPAs	

Additional comments and site benefits:

¹Although this rMCZ does not meet the minimum viable size for BSHs (5km minimum diameter) the entire estuary unit is contained within the rMCZ boundary. Therefore this rMCZ is believed to be viable for all BSHs (using Natural England expert judgement).

² No quantitative information is included for this mobile FOCI species in the FS tables, as the GIS data is too coarse a resolution to be meaningful. However, the species has been included in the draft conservation objectives on the basis of evidence provided to the FS project by the EA. (SAD in (Lieberknecht, et al. 2011)).

Described as 'relatively pristine' in a 1978 sediment and *Scrobicularia plana* survey (Luoma 1978).

Nursery area for fish including bass.

³ This is an estuary area with high productivity and an important function as a nursery area for mobile species

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 derived from 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 in Annex H.

Table 5a. Fish and shellfish for human consumption		rMCZ Axe Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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.</p> <p>However, there is currently no commercial fishing within the rMCZ and therefore no value derived from on-site fisheries. It has not been possible to estimate the value derived from off-site fisheries as a result of the nursery area function.</p>	<p>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.</p> <p>No change in on-site 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).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence : Moderate</p>

Table 5b. Recreation		rMCZ Axe Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 estuary is a nursery area for fish (including bass) (Environment Agency,</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p>

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Table 5b. Recreation		rMCZ Axe Estuary
<p>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.</p> <p>Angling occurs in Axemouth harbour for species such as mullet and, occasionally, flounder, as well as further up the river. Seaton Beach, just outside the rMCZ, is a particularly popular local angling spot. It has not been possible to estimate the value of angling on-site or the proportion of the value derived from angling off-site that results from the estuary nursery area.</p>	<p>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).</p> <p>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.</p>	<p>Confidence: Moderate</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	N/A	N/A
<p>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.</p> <p>The estuary is a popular area for wildlife watching, particularly bird watching over the estuary and adjacent marshes. There are viewing platforms and hides along the western bank of the estuary, provided as part of East Devon District Council's management of the local nature reserve. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ Axe Estuary
Baseline	Beneficial impact under Policy Option 1	

Table 5c. Research and education		rMCZ Axe Estuary
<p>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.</p> <p>The extent of current research activity carried out at the estuary is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>There is an existing programme of education events at the Axe Estuary, managed by East Devon District Council and run from the Field Studies Base and Wetlands Classroom (capacity: 50 people). This includes indoor and outdoor events and open days for the public and schoolchildren (Seaton Bay, 2012). The estuary has high numbers of visitors. It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	MCZ designation may provide an opportunity to expand the focus of education events into 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).	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Axe Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 <i>Spartina anglica</i> which grows in intertidal mud (Fletcher and others, 2012).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p>Natural hazard protection: The features of the site, in particular the coastal saltmarshes and intertidal habitats, contribute to local flood and storm</p>	<p>If the conservation objectives are achieved, the features of the site will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>Designating the recommended Marine Conservation Zone (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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Axe Estuary
protection (Fletcher and others, 2011).		
It has not been possible to estimate the value of regulating services in the site.		

Table 5e. Non-use and option values		rMCZ Axe Estuary
Baseline	Beneficial impact under Policy Option 1	
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 their 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 the option to benefit from the services in the future from the risk of future degradation.	Anticipated direction of change:  Confidence: Moderate

rMCZ Bideford to Foreland Point**Site area (km²): 101.0**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts	rMCZ Bideford to Foreland Point
1a. Ecological description	
<p>The site boundary follows the coastline along the mean high water mark and the width of the site varies between 0.5km and 2.5km. The site's maximum depth is 36 metres. There are a number of coastal Sites of Special Scientific Interest along the stretch of coastline covered by the recommended Marine Conservation Zone (rMCZ), many of which include intertidal areas and therefore overlap with the rMCZ. The area is within the North Devon's Biosphere Reserve and the coastline between Combe Martin and Croyde is a voluntary MCZ.</p>	
<p>The stretch of coastline between Westward Ho! and Foreland Point is characterised by cliffs and rocky shores, with small sandy bays and inlets. The exception is Bideford Bay, an expanse of sandy shoreline backed by extensive sand dunes at the mouth of the Taw Torridge Estuary system. The area intersects with an area of higher than average benthic species and habitat diversity (within the South-West).</p>	
<p>Areas of sublittoral sea bed are restricted to narrow current-swept channels with some extensive hard substrata including bedrock, cobbles and shell or pebbles in gravel colonised especially by hydroids, sponges, sea anemones, erect bryozoans, barnacles and mussels. Sublittoral sediments have a restricted fauna of species characteristic of disturbed conditions, including the worms <i>Nephtys cirrosa</i> and <i>Lanice conchilega</i> and the amphipods <i>Haustorius arenarius</i> and <i>Bathyporeia sarsi</i>. The sublittoral communities are thought to have a 'strong regional characteristic with sparse algal communities and rocks in many areas dominated by mussels'.</p>	
<p>The beaches at Woolacombe are known to include rocky shore communities adjacent to sand characterised by solitary and small colonies of the honeycomb worm <i>Sabellaria alveolata</i> and by the barnacle <i>Balanus perforatus</i>. The coarse sandy beaches are colonised by species characteristic of mobile sand, including the isopod <i>Eurydice pulchra</i> and cirratulid polychaetes. At Wild Pear beach, in Combe Martin Bay, the mid-shore habitats are dominated by barnacles and limpets with sparse algal cover. Two species of particular interest are the uncommon strawberry anemone <i>Actinia fragacea</i> and the honeycomb worm <i>Sabellaria alveolata</i>.</p>	
<p>The Exmoor coastline consists predominantly of boulder shores with occasional rocky reefs and some stretches of sand. Moderate to severe wave action reduces boulder stability which in turn reduces species richness within littoral communities. There is a rich littoral fauna off Ilfracombe: many species occur under overhangs on the lower shore where shaded, damp conditions and the turbid North Devon waters lead to the presence of circalittoral species in the intertidal area. North of Ilfracombe there are reefs of the tube-building polychaete worm <i>Sabellaria spinulosa</i>, with recorded densities of over 3,000 individuals per square metre.</p>	
<p>Anecdotal evidence about features of conservation importance exists for: tide-swept channels near the mouth of the Taw Torridge; fragile sponge and anthozoan communities on subtidal rocky habitats; intertidal underboulder communities; sheltered muddy gravels; and Ross worm <i>Sabellaria spinulosa</i>, European eel <i>Anguilla anguilla</i>, the peacock's tail alga <i>Padina pavonica</i>, crawfish <i>Palinurus elephas</i>, anglerfish <i>Lophius piscatorius</i>, common maerl, sea slug <i>Onchidella celtica</i>, sea star <i>Asterina phylactica</i>, anemone <i>Anthopleura thallia</i>, the leopard-spotted goby <i>Thorogobius ephippiatus</i>, the allis shad <i>Olosa olosa</i>, native oyster <i>Ostrea edulis</i> and blue mussel <i>Mytilus edulis</i>. Rare, scarce and sensitive species indicated as present are: the scarlet and gold star coral <i>Balanophyllia regia</i>, the Weymouth carpet coral <i>Hoplania durotrix</i>, the policeman</p>	

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anemone *Mesacmaea mitchellii*, Devonshire cup coral *Caryophyllia smithii*, the stalked jellyfish *Haliclystus auricula*, the short-snouted seahorse *Hippocampus hippocampus* and sole *Solea solea*.

The site is important for sea birds, particularly guillemot *Uria aalge* and razorbill *Alca torda*, and for cetaceans, particularly Atlantic grey seal *Halichoerus grypus* and harbour porpoise *Phocoena phocoena*. It is also a spawning, nursery and juvenile area for bass and salmon (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
<i>Broad-scale Habitats</i>				
High energy circalittoral rock	1.42	-	Unfavourable Condition	Recover to Favourable Condition
SNCBs advice that the conservation objective for high energy circalittoral rock is changed from “Recover” to “Maintain”.				
High energy infralittoral rock	8.60	-	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	0.89	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	0.76	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.43	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	7.70	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.33	-	Favourable Condition	Maintained at Favourable Condition
Low energy intertidal rock	0.12	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy infralittoral rock	3.99	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.40	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	54.20	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	20.99	-	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
Sabellaria alveolata reefs	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				

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Euincella verrucosa	-	3	Favourable Condition	Maintained at Favourable Condition
Paludinella littorina	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Non-ENG Mobile Species</i>				
Uria aalge	-	-	Favourable Condition	Maintained at Favourable Condition
Phocoena phocoena	-	-	Favourable Condition	Maintained at Favourable Condition
Alca torda	-	-	Favourable Condition	Maintained at Favourable Condition
Halichoerus grypus	-	-	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 Bideford to Foreland Point
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
A total of 19 wrecks are recorded in the site (English Heritage, pers. comm., 2012).	An extra cost will 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 involved 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 Bideford to Foreland Point
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Table 2b. Commercial fisheries		rMCZ Bideford to Foreland Point
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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 reflects the uncertainty. Should the site be designated, the management that will be required is likely to fall somewhere within this range.</p> <p>Management scenario 1: No additional management.</p> <p>Management scenario 2: Zoned closure of areas of high energy circalittoral rock to bottom trawls and dredges.</p> <p>Management scenario 3: Zoned closure of areas of high energy circalittoral rock to bottom trawls, dredges, pots and traps, nets, and hooks and lines.</p> <p>Management scenario 4: Closure of entire rMCZ to bottom trawls and dredges.</p> <p>Management scenario 5: Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, and hooks and lines.</p>		
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1
<p>Overview: The rMCZ is wholly inside 6nm, extending to a maximum of approximately 1nm from the coast, and a number of commercial fisheries restrictions are already in existence (listed in Annex E). There is no non-UK activity in the rMCZ. The area is primarily fished by potters, which account for the majority of the estimated annual landings from the rMCZ. The key species caught are lobster, edible crab and spider crab. There is hand lining for mackerel, a small amount of netting and some benthic trawling in the area. There is a local fleet of approximately 15 vessels based at Barnstaple and Ilfracombe harbours on the rMCZ coastline. Estimated total value of UK vessel landings from the rMCZ: £0.053m/yr.</p>		
<p>UK Bottom trawl: The wider Bideford Bay area is a key trawling ground for the North Devon fleet. The fishing ground overlaps with the western edge of the rMCZ, although fishing effort within the rMCZ is thought to be low (Finding Sanctuary Vulnerability Assessments, 2011). Trawlers may fish inside the western part of the rMCZ at certain times of the year, targeting plaice and ray (North Devon Fishermen's Association (NDFA), pers. comm., 2012). There is not thought to be any effort in the rMCZ on the north-facing coastline (Finding Sanctuary Vulnerability Assessments, 2011; NDFA, pers. comm., 2012). Bottom trawl activity does not focus on the areas of high energy circalittoral rock (that is subject to closure in Scenario 2) within the rMCZ, being limited by the rocky sea bed, and the value of landings associated with the area is low (Finding Sanctuary Vulnerability Assessments, 2011). Estimated value of landings from the rMCZ: £0.014m/yr. Estimated value of UK bottom trawl</p>		<p>Scenario 1: No impacts are anticipated under this scenario.</p> <p>Scenarios 2 and 3: As the areas of high energy circalittoral rock are not targeted by bottom trawls and are tight in to the coastline, closure of only these areas to bottom trawling is not expected to result in any significant displacement or affect the pattern of fishers' tows in the area. The value of landings that will be affected is low at £0.001m/yr.</p> <p>Scenarios 4 and 5: If the entire site is closed to bottom trawling, it is anticipated that fishing will be displaced west into the main area of the Bideford Bay trawling ground. It is thought that this would not significantly affect fishers (NDFA, pers. comm., 2011). However, if significant displacement from the wind farm area occurs as a result of the proposed development, then a higher level of landings may be affected by the rMCZ. This increased impact may be more significant.</p> <p>Estimated annual value of UK bottom trawl landings affected is expected to fall within the</p>

Table 2b. Commercial fisheries		rMCZ Bideford to Foreland Point				
<p>landings from the areas of high energy circalittoral rock: £0.001m/yr.</p> <p>The proposed Atlantic Array wind farm is expected to result in the exclusion of trawlers from the wind farm area due to safety risks associated with trawling between turbines (NDFA, 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 (NDFA, pers. comm., 2011 and 2012).</p>	following range:					
	<i>£m/yr</i>	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
	Value of landings affected	0.000	0.001	0.001	0.014	0.014
<p>Pots and traps: In total, 8 potters are thought to fish within the rMCZ. Of these, 3 are vessels under 10 metres fishing out of Bideford working approximately 200 to 300 pots each. They principally target lobster between the months of March through to September and their fishing effort is concentrated within and just outside the rMCZ, particularly around Lee Bay on the north coast. Five other potters from Ilfracombe, all vessels over 10 metres, work in and just outside the rMCZ during the spring before moving further offshore towards Lundy to target crab during the summer (NDFA, pers. com., 2012).</p> <p>Estimated value of pot and trap landings from the rMCZ: £0.027m/yr. Estimated value of UK pot and trap landings from the areas of high energy circalittoral rock: £0.004m/yr.</p> <p>The extent of potting within the rMCZ indicated by NDFA (pers. comm., 2012) indicates that the modelled value of landings set out above may be an underestimate.</p>	<p>Scenarios 1, 2 and 4: No impacts are anticipated under these scenarios.</p> <p>Scenario 3: Up to 8 potters may be affected by the rMCZ under this scenario, although the extent to which each fishes within the rMCZ is unclear. The estimated value of landings affected indicates that there would not be any significant impacts on the fishers, although stakeholder information indicates that this may not be the case (NDFA, pers. comm., 2012).</p> <p>Scenario 5: A total of 8 potters are expected to be affected by the rMCZ under this scenario. A significant proportion of fishing activity by 3 vessels under 10 metres would be affected and 5 vessels over 10 metres would be seasonally affected. While the modelled value of landings estimate does not indicate that the rMCZ would necessarily result in the operation of the vessels becoming unviable, stakeholder information indicates that the value of landings affected may be considerably higher and that vessel viability may be affected (NDFA, pers. comm., 2012).</p> <p>The ability of the smaller vessels (under 10 metres in particular) to fish further offshore is limited due to the exposed nature of the coast. If fishers chose to increase fishing effort further offshore outside the rMCZ then this may increase safety risks. It may also result in gear conflict with other existing potters and mobile gear fishers.</p> <p>Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:</p>					
	<i>£m/yr</i>	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
	Value of landings affected	0	0	0.004	0	0.027
In establishing the draft conservation objectives, the site features were assessed as having						

Table 2b. Commercial fisheries		rMCZ Bideford to Foreland Point																	
		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 a ‘recover’ conservation objective. 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.																	
<p>UK Nets: There is a low level of netting in the rMCZ. One netter used to fish in the area but is no longer active, and another vessel has recently (2011) started to target bass off Baggy Point (NDFA, pers. comm., 2012). In addition, 4 boats occasionally drift net for bass within the mouth of the Taw-Torridge Estuary. It is unclear whether this activity overlaps with the rMCZ.</p> <p>Estimated value of UK net landings from the rMCZ: £0.012m/yr. Estimated value of UK net landings from the areas of high energy circalittoral rock: £0.000m/yr.</p> <p>The modelled value of landings estimate is based on data from 2007 to 2010. The netter currently active within the rMCZ started fishing in the area in 2011 and therefore the vessel landings are not included in the value of landings estimate. As such, the value of landings estimate is expected to be an underestimate.</p>		<p>Scenarios 1, 2 and 4: No impacts are anticipated under these scenarios.</p> <p>Scenario 3: One netter will be affected by the rMCZ under this scenario. The value of landings estimate is expected to be an underestimate.</p> <p>Scenario 5: Under this scenario, one netter will be affected by the rMCZ, and drift netters working within the mouth of the Taw-Torridge Estuary may be affected. The value of landings estimate is expected to be an underestimate.</p> <p>Estimated annual value of UK net landings affected is expected to fall within the following range:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td><td>Scenario 5</td></tr><tr><td>Value of landings affected</td><td>0</td><td>0</td><td>0.000</td><td>0</td><td>0.012</td></tr></table> <p>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 a ‘recover’ conservation objective. 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.</p>						£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Value of landings affected	0	0	0.000	0	0.012
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5														
Value of landings affected	0	0	0.000	0	0.012														

Table 2b. Commercial fisheries		rMCZ Bideford to Foreland Point						
<p>UK Hooks and lines: The rMCZ is not an area known to be targeted by fishers using hooks and lines (Finding Sanctuary Vulnerability Assessments, 2011), and the value of landings from the rMCZ is low. However, 4 vessels using rod and line are thought to occasionally target bass off Baggy Point (NDFA, pers. comm., 2012).</p> <p>Estimated value of hook and line landings from the rMCZ: £0.001m/yr. Estimated value of UK hook and line landings from the areas of high energy circalittoral rock: less than £0.001m/yr.</p>	<p>Scenarios 1, 2 and 4: No impacts are anticipated under these scenarios.</p> <p>Scenario 3: Fishing effort within the rMCZ is thought to be low, as indicated by the value of landings estimate. No significant impacts are therefore anticipated under this scenario.</p> <p>Scenario 5: Up to 4 occasional rod and line fishers may be affected by the rMCZ under this scenario; however, the value of landings affected is low.</p> <p>Estimated annual value of UK hook and line landings affected is expected to fall within the following range:</p>							
	£m/yr		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	
	Value of landings affected		0	0	<0.001	0	0.001	
	<p>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 a ‘recover’ conservation objective. 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.</p>							
Total direct impact under Policy Option 1								
<p>Total direct impact on UK commercial fisheries</p>	<p>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:</p>							
	£m/yr		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Best estimate
	Value of landings affected		0.000	0.001	0.006	0.014	0.053	0.004
	GVA affected		0.000	0.001	0.003	0.006	0.025	0.002
<p>The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be</p>								

Table 2b. Commercial fisheries	rMCZ Bideford to Foreland Point
	an under- or over-estimate for this site.
Impact on non-UK commercial fisheries	None.

Table 2c. Flood and coastal erosion risk management (coastal defence)	rMCZ Bideford to Foreland Point
Source of costs of the rMCZ under Policy Option 1 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 under Policy Option 1
The 0 to 20 year Shoreline Management Plan (SMP) policies along the coastline of the rMCZ at Braunton Burrows and Saunton Down, Croyde Bay and Woolacombe Bay are for 'no active intervention'. Between Morte Point and Foreland Point the SMP policy is primarily no active intervention, with some areas of 'hold the line' in order to protect key assets. New 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 Bideford to Foreland Point
Source of costs of the rMCZ under Policy Option 1		
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	Cost of impact of rMCZ on the sector under Policy Option 1	
MOD is known to make use of the rMCZ for water column activities.	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. Ports, harbours, shipping and disposal sites		rMCZ Bideford to Foreland Point	
Source of costs of the rMCZ under Policy Option 1			
Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for known specific plans or proposals for port and harbour developments 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 future licence applications for proposed and 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 harour developments...			
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1	
<u>Harbour development:</u> Ilfracombe is the largest harbour on the north Devon coast and is situated adjacent to the rMCZ. Ilfracombe Harbour has significant redevelopment plans, the purpose of which is to update and improve existing services as well as enable new services to be offered, including to the offshore renewables industry. The plans include the development of an outer breakwater and southern commercial quay, development/redevelopment of shore-side facilities, and provision of deep	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.001	0.002*
*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.			

Table 2e. Ports, harbours, shipping and disposal sites	rMCZ Bideford to Foreland Point
<p>water moorings for cross-channel ferries, cruise liners and an offshore energy support service (Ilfracombe Harbour Board, 2009). New infrastructure associated with the redevelopment will not overlap with the rMCZ. The timing of the redevelopment activity is not yet certain; however, it is anticipated that work on the inner harbour may be taken forward within 2 years (licence application assumed in 2014) and works on the outer breakwater within 5 years (licence application assumed in 2017) (Ilfracombe Harbour Master, pers. comm., 2011).</p> <p>Other ports within 5km of the rMCZ include Appledore and Lynmouth. No known port and harbour developments are planned at these ports.</p>	<p>Scenario 1: As a result of the designation of the rMCZ, the licence applications for the Ilfracombe Harbour redevelopment plan 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. It is assumed that two separate licence applications will be submitted for the inner and outer works, one in 2014 and one in 2017, although it should be noted that one licence application may be made to cover both elements (Ilfracombe Harbour Master, pers. comm., 2012). This is expected to result in two additional one-off costs of approximately £0.007m each in 2014 and 2017 (see Annex N11 for details).</p> <p>Scenario 2: For the Ilfracombe Harbour development, additional costs of £0.007m in 2014 and 2017 are expected as described under Scenario 1. No additional mitigation, above that which would be required in the baseline, is anticipated (Natural England, pers. comm., 2012).</p> <p>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.</p>

Table 2f. Renewable energy	rMCZ Bideford to Foreland Point
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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)</p> <p>Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and increase in cable protection costs for power export cables and</p>	

Table 2f. Renewable energy		rMCZ Bideford to Foreland Point							
inter-array cables (relative to the mitigation provided in the baseline)									
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1							
<p>Tidal energy: The rMCZ overlaps with the inner Bristol Channel tidal energy Potential Development Area (PDA) (PMSS, 2010). Any likely development could have a footprint within the PDA of 10km² (PMSS, 2010) covering 0.4% of the PDA. The rMCZ covers 2.7% of the PDA. As the location of any potential energy generation installation is not known, the possible overlap of inter-array and export cables with the rMCZ is also not known. A lease was granted in 2012 to a developer by The Crown Estate for a test site off the north facing coast (The Crown Estate, 2012). A license application is assumed to come forward for the test site in the period 2015 to 2020. One further tidal energy installation is anticipated, with a license application assumed to come forward in the period 2020 to 2025 (Department of Energy and Climate Change, pers. comm., 2011). By 2030 the developments in the PDA are expected to have a production capacity of 600MW (PMSS, 2010).</p>		<p>Scenario 1: As a result of the designation of the rMCZ, the two potential licence applications for the tidal energy installations will be 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 two additional one-off costs of £0.017m in 2015 and 2020 (based on an average cost provided by renewable energy sector developers; see Annex N for details).</p> <p>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 taken from costs supplied by wind energy developers; see Annex H13 for details) and, as such, the total mitigation cost could be significant.</p> <p>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.</p> <p>The impacts that are assessed in both scenarios are based on JNCC and Natural England's advice on the mitigation that could be required.</p> <p>The estimated cost to tidal energy developers of this rMCZ is expected to fall within the following range:</p> <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>0.034</td><td>At least 0.034</td></tr></table>		£m (one-off cost)	Scenario 1	Scenario 2	Cost to the operator	0.034	At least 0.034
£m (one-off cost)	Scenario 1	Scenario 2							
Cost to the operator	0.034	At least 0.034							

Table 2g. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Bideford to Foreland Point
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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Bideford to Foreland Point
Cables (interconnectors and telecom cables); recreation (wildlife watching subject to general code of conduct); research and education; water abstraction, discharge and diffuse pollution.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ²	rMCZ Bideford to Foreland Point
✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.	

² copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A1.1 High energy intertidal rock	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the second largest area of high energy intertidal rock		Out of all the rMCZs in the project area, this site contributes the second largest area of high energy intertidal rock
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the largest area of moderate energy intertidal rock		Out of all the rMCZs in the project area, this site contributes the second largest area of moderate energy intertidal rock
A1.3 Low energy intertidal rock	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the largest area of low energy intertidal rock		

Annex I2. Impact Assessment materials (Finding Sanctuary).

A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the second largest area of intertidal coarse sediment		Out of all the rMCZs in the project area, this site contributes the second largest area of intertidal coarse sediment
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓	None	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	✓	None	Maintain			
A2.4 Intertidal mixed sediments	BSH	✓	✓	✓	None	Maintain			
A3.1 High energy infralittoral rock	BSH	✓	✓	X	Viability not met, site less than 5km minimum diameter	Maintain	Out of all the rMCZs in the FS area, this site contributes the second largest area of high energy infralittoral rock		

Annex I2. Impact Assessment materials (Finding Sanctuary).

A3.2 Moderate energy infralittoral rock	BSH	✓	✓	X	Viability not met, site less than 5km minimum diameter	Maintain	Out of all the rMCZs in the FS area, this site contributes the second largest area of moderate energy infralittoral rock		
A4.1 High energy circalittoral rock	BSH	✓	✓	X	Viability not met, site less than 5km minimum diameter	Recover			
A5.1 Subtidal coarse sediment	BSH	✓	✓	X	Viability not met, site less than 5km minimum diameter	Maintain	This BSH is currently only reaching the minimum adequacy target	Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
A5.2 Subtidal sand	BSH	✓	✓	X	Viability not met, site less than 5km minimum diameter	Maintain		Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	

Annex I2. Impact Assessment materials (Finding Sanctuary).

Pink sea-fan <i>Eunicella verrucosa</i>	FOCI Species	✓	X	X	Viability not met, patch less than 5km minimum diameter	Maintain			BAP and WCA species
Sea snail <i>Paludinella littorina</i>	FOCI Species	✓	✓	✓	None	Maintain			OSPAR and WCA species
Honeycomb worm <i>Sabellaria alveolata</i> reefs	FOCI Habitat	✓	✓	✓ * 1	None	Maintain			BAP habitat
Common guillemot <i>Uria aalge</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			OSPAR species
Razorbill <i>Alca torda</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			
Harbour porpoise <i>Phocoena phocoena</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			BAP, OSPAR and WCA species
Grey seal <i>Halichoerus grypus</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			
Site considerations									
Connectivity				✓ * 2					

Annex I2. Impact Assessment materials (Finding Sanctuary).

Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓ * ³
Overlaps with existing MPAs	✓

Additional comments and site benefits:

¹ Viability for *Sabellaria alveolata* reefs requires a minimum patch diameter of 0.5km. A 500m area encompassing the record is possible within the rMCZ.

² This site is critical for connectivity along the north coast of Devon and Cornwall, which currently has no MPAs other than Lundy.

³ This area has been identified as a hotspot for harbour porpoise (*Phocoena phocoena*) (Goodwin 2008).

Only a small proportion (<1%) of the BSH subtidal coarse sediment and BSH subtidal sand is currently protected within existing MPAs in the FS area. Therefore, MCZs are critical for the protection of these features BSHs subtidal coarse sediment and subtidal sand in this region.

The site intersects with an area of higher than average benthic diversity (SAD in (Lieberknecht, et al. 2011)).

Covers the existing VMCA, established to help raise awareness of the diversity of coastal wildlife.

This site has been highlighted as a hotspot for harbour porpoise (*Phocoena phocoena*), where they have been found to aggregate in the area of high tidal flow at Morte Point (Goodwin 2008)

This site contains a diverse range of littoral habitats that are currently unprotected along the north coast of Devon and Cornwall.

This rMCZ contains areas studied by in the Victorian era. More recent revisits shows the continued presence of a rich littoral fauna ((Hiscock, K. (ed.) 1998)).

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 5a. Fish and shellfish for human consumption		rMCZ Bideford to Foreland Point
Baseline	Beneficial impact under Policy Option 1	
<p>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 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 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).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2.</p>	<p>If the conservation objectives of the features are achieved, the area of high energy circalittoral rock habitat will recover to favourable condition. Other site habitats and species 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.</p> <p>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.</p> <p>As the rMCZ is small and some fishing activity may still be permitted, it is unclear whether it would have any impact on stocks of mobile commercial finfish species. Stocks of low mobility and site-attached species, such as lobster and crab, may improve as a result of a recovery in the condition of circalittoral rock habitat and reduced fishing pressure. If some fishing for such species is permitted within the rMCZ, then catches may improve. Localised beneficial spill-over effects may occur throughout the rMCZ.</p> <p>The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision or the off-site impacts of displaced effort.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Bideford to Foreland Point
Baseline	Beneficial impact under Policy Option 1	
Angling: Fletcher and others (2012) identify that the features to be protected	If the conservation objectives of the features are achieved, the area of high	Anticipated

Table 5b. Recreation	rMCZ Bideford to Foreland Point	
<p>by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. Circalittoral and infralittoral rock are important habitats for inshore commercial fisheries species, particularly crab and lobster, as are subtidal sediments (Fletcher and others, 2011).</p> <p>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).</p> <p>Sea fishing is available from charter boats in Bideford and Ilfracombe, with plaice, mackerel, bass and conger among the likely catches. Shore angling for species including mackerel, bass and grey mullet takes place, with the most intensively used areas between Combe Martin Bay in the east and Baggy Point in the west. It has not been possible to estimate the value of angling in the site.</p>	<p>energy circalittoral rock habitat will recover to favourable condition. Other site habitats and species 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.</p> <p>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.</p> <p>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 in the site and therefore the value of the ecosystem service.</p> <p>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.</p>	<p>direction of change:</p> <p>↑</p> <p>Confidence: Low</p>
<p>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 and unfavourable condition (see Table 1b).</p> <p>There are a number of dive spots in the rMCZ, with concentrations around Rockham Bay and Lee Bay as well as off Baggy Point, Widmouth Head and Combe Martin Bay.</p>	<p>If the conservation objectives of the features are achieved, the area of high energy circalittoral rock habitat will recover to favourable condition. Other site habitats and species will be maintained in favourable condition.</p> <p>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 in the site and therefore the value of the ecosystem service.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>
<p>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 and unfavourable</p>	<p>If the conservation objectives of the features are achieved, the area of high energy circalittoral rock habitat will recover to favourable condition. Other site habitats and species will be maintained in favourable condition.</p> <p>An improvement in the condition of site features and any associated increase in the abundance and diversity of species that are visible to wildlife watchers</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5b. Recreation		rMCZ Bideford to Foreland Point
condition. The National Trust provides several walks around Foreland Point for visitors to enjoy the wildlife, including rockpooling. Charter boats operating out of Ilfracombe and Lynmouth offer wildlife watching trips in the area. It has not been possible to estimate the value of wildlife watching in the rMCZ.	may improve the quality of wildlife watching in 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 a redistribution of location preferences, rather than an overall increase in UK wildlife watching visits.	Confidence: Low



Table 5c. Research and education		rMCZ Bideford to Foreland Point
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The rMCZ is situated within the North Devon Biosphere Reserve, through which a variety of research activities are undertaken. The full extent of current research activity carried out in the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	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
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The rMCZ is situated within the North Devon's Biosphere Reserve, and is therefore linked into a number of UNESCO education programmes. Education resources for schools are provided and on-line education tools (at www.northdevonbiosphere.org.uk). Education events with a specific marine and coastal theme are organised in and around the rMCZ by Coastwise North Devon and Braunton Countryside Centre. 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.</p>	MCZ designation may provide an opportunity to expand the focus of education events into 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 education resources developed for use in schools).	Anticipated direction of change:  Confidence: Moderate

Table 5d. Regulating services		rMCZ Bideford to Foreland Point
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock can support particularly high biodiversity (Fletcher and others, 2012).</p> <p>Natural hazard protection: The features of the site, in particular intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives are achieved, some of the features of the site will be recovered to favourable condition. Others will be maintained in favourable condition.</p> <p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Bideford to Foreland Point
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p> <p>Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society's 'Your Seas Your Voice'</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values	rMCZ Bideford to Foreland Point
	<p>campaign expressed a desire to protect the area, with the most common reasons being because of the 'spectacular scenery', because 'the whole place is amazing' and because 'it means a great deal to me personally'.</p>

rMCZ Broad Bench to Kimmeridge Bay**Site area (km²): 0.09**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts		rMCZ Broad Bench to Kimmeridge Bay		
1a. Ecological description				
<p>The site lies adjacent to the Studland to Portland designated Special Area of Conservation (SAC) (above the high water mark). It also lies entirely within the Purbeck Voluntary Marine Nature Reserve as well as within the Portland to Studland Cliffs coastal SAC and the South Dorset Site of Special Scientific Interest.</p> <p>The recommended Marine Conservation Zone (rMCZ) is intertidal, characterised by rocky ledges. The strata are all sedimentary in origin. The geology of the coastline is probably its most outstanding feature and the underlying reason for the diversity of habitats and features which are found here. This area represents the eastern limit along the Channel of a number of species which have a south-western (Lusitanian) distribution.</p> <p>The tidal range is small, with a maximum spring tide range of only 2 metres. On spring tides at Kimmeridge, a three-hour stand at low water occurs at mid-day – exposing the shore to high desiccation and light levels and to extreme temperatures. This encourages algal diversity and the presence of species with a normally southern or even Mediterranean range. Key species include the black-faced blenny <i>Trypterygion atlanticus</i>, Cranch’s spider crab <i>Achaeus cranchi</i>, the sea slug <i>Aeolidiella alderi</i>, the sea squirt <i>Phallusia mammillata</i> (in deeper water) and the unusual alga <i>Cystoseira tamariscifolia</i> (which is on the edge of its range at Kimmeridge).</p> <p>Much of the shallow sublittoral rock has a kelp fringe with associated red algae and invertebrates down to about 12 metres. Where bedrock is subject to scour, this is replaced by sea oak (podweed). Below these kelp zones is a zone dominated by red algae. Beyond this, the sea bed is dominated by sponges, bryozoans such as Ross coral <i>Sabellaria spinulosa</i> (here at its eastern limit), horn wrack and hydroids. Vertical bedrock faces have a rich encrusting layer of animals such as colourful sponges, dead man’s fingers, cup corals and anemones. Wrasse and gobies abound, as do tompot blennies. Much of the softer bedrock is bored by piddocks, leaving the characteristically riddled appearance. Extensive beds of brittlestar <i>Ophiothrix fragilis</i> have been mapped on the rock platforms forming the seaward extension of Broad Bench.</p> <p>Shallow water kelp forests harbour a number of rare seaweeds such as the red seaweed <i>Gracilaria bursa-pastoris</i> and the brown seaweeds <i>Zanardinia prototypus</i> and <i>Padina pavonica</i>. Among the seaweeds are anemones such as the trumpet anemone <i>Aiptasia mutabilis</i> and sea slugs such as <i>Trapania maculata</i> and <i>T. pallida</i>. Several unusual fish are found at Kimmeridge such as Montagu’s blenny, the Connemara clingfish, the Cornish sucker and the rarely recorded black-faced blenny occurring on rocky ledges. Bream are also thought to nest in the area (Lieberknecht and others, 2011).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				

Annex I2. Impact Assessment materials (Finding Sanctuary).

Intertidal coarse sediment	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.03	-	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Padina pavonica</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Paludinella littorina</i>	-	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. National defence		rMCZ Broad Bench to Kimmeridge Bay
Source of costs of the rMCZ under Policy Option 1		
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	Cost of impact of rMCZ on the sector under Policy Option 1	
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 2b. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Broad Bench to Kimmeridge Bay
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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Broad Bench to Kimmeridge Bay
Commercial fisheries (potting); oil and gas related activities (existing activity); recreation; research and education	

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale³</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>								rMCZ Broad Bench to Kimmeridge Bay	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale

³ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

					guidelines				
A1.2 Moderate energy intertidal rock	BSH	✓	✓	X	None	Maintain			
A2.1 Intertidal coarse sediment	BSH	✓	✓	X	None	Maintain			
Peacock's tail <i>Padina pavonica</i>	FOCI Species	✓	✓	✓ * 1	None	Maintain	This FOCI is currently reaching only the minimum replication target	This feature is not protected within existing MPAs	
Sea snail <i>Paludinella littorina</i>	FOCI Species	✓	✓	X	The min. diameter of the rMCZ is less than the min. viable patch diameter for this FOCI species	Maintain		Only one replicate of this feature is protected within existing MPAs	

Site considerations	
Connectivity	✓

Annex I2. Impact Assessment materials (Finding Sanctuary).

Geological/Geomorphological features of interest	None
Appropriate boundary	X
Areas of Additional Ecological Importance	✓
Overlaps with existing MPAs	✓

Additional comments and site benefits:

¹ Viability for the FOCI species *Padina pavonica* is dependent on patch diameter (0.5km). In some cases, viability in the intertidal has been considered where this is met in linear length alone, which is met here, so is considered viable.

Although the site is intended to be intertidal, it does also include some of the subtidal area. The subtidal area is species rich, dominated by sponges, rare algae's, and bryozoans (for example, Ross coral at its most eastern limit), horn wrack and hydroids. Vertical rock faces with encrusting animals such as cup corals and anemones are present and would be a very rich addition to the network if the boundary is retained as it is.

Broad Bench to Kimmeridge is a representative area of very rich intertidal habitat which supports lots of species. The areas richness has led to creation of a voluntary marine reserve previously. This has resulted in a visitor centre and marine interpretation centre at Kimmeridge Bay which is run by the Dorset Wildlife Trust for interpretation of the marine environment, education, and research work.

The rMCZ has scientific value as the marine reserve status has attracted survey work in the area within intertidal and subtidal habitats.

There is scientific value in this site because this is a well-studied site with good data from a range of sources (SAD in (Lieberknecht, et al. 2011), pages 416 and 424).

The geology of the coastline is probably its most outstanding feature and the underlying reason for the diversity of habitats and features which are found here.

This rMCZ also intersects with polygonal data which The Seahorse Trust provided via our interactive map, indicating the stretches of the south-west coastline along which one or both species of seahorse are found.

The intertidal area is rich in species, including the black faced blenny (*Trypterygion atlanticus*), and the unusual alga *Cystoseira tamariscifolia* (SAD in (Lieberknecht, et al. 2011), page 417).

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 5a. Fish and shellfish for human consumption		rMCZ Broad Bench to Kimmeridge Bay	
Baseline	Beneficial impact under Policy Option 1		
<p>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. 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.</p> <p>As the rMCZ is very small and covers only the intertidal area, fishing within the rMCZ is thought to be very limited and it is estimated that the value of landings from the rMCZ is <£0.001m/yr. Commercial fishing with pots and traps and nets occurs in the vicinity of the rMCZ.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence : Moderate</p>	

Table 5b. Recreation		rMCZ Broad Bench to Kimmeridge Bay	
Baseline	Beneficial impact under Policy Option 1		
<p>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.</p> <p>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.</p> <p>As the rMCZ is very small and covers only the intertidal area, angling within the rMCZ is thought to be limited. It has not been possible to estimate the</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>	

Table 5b. Recreation	rMCZ Broad Bench to Kimmeridge Bay	
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.	
<p>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.</p> <p>Kimmeridge Bay provides a sheltered water sports location for activities such as SCUBA diving and snorkelling. It has not been possible to estimate the value of diving in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to diving are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>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.</p> <p>Dorset Wildlife Trust provides kayak safaris in Kimmeridge Bay to view the local marine wildlife, which includes sand eels, ballan wrasse, mullet and bass, diving cormorants, spider crabs, blennies, shore crabs and seaweeds (Dorset Wildlife Trust, 2012). It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ Broad Bench to Kimmeridge Bay	
Baseline	Beneficial impact under Policy Option 1		
<p>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.</p> <p>The rMCZ is situated within the Purbeck Voluntary Marine Nature Reserve. Research projects and surveys are carried out in the reserve, including the rMCZ, such as the annual Shore Thing survey which contributes to a national survey monitoring intertidal climate change indicators. The full extent of current research activity carried out in the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>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.</p>		<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) <i>identify</i> that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The rMCZ is situated within the Purbeck Voluntary Marine Nature Reserve. The Fine Foundation Marine Centre is located at Kimmeridge Bay. This centre provides interpretation of the marine environment and includes interactive displays and aquaria. It also offers a number of public events, including curriculum-based talks, run by volunteer marine wardens. Guided glass-bottom kayak safaris were on offer during summer 2011, and in 2010 the Purbeck warden worked with the BBC <i>Springwatch</i> team to deliver pieces on Kimmeridge Bay. In the second quarter of 2010, nearly 8,000 people visited the centre (Hatcher, 2010). It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	<p>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).</p>		<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Broad Bench to Kimmeridge Bay	
Baselie	Beneficial impact under Policy Option 1		
Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2012).	If the conservation objectives are achieved, the features of the site will be maintained in favourable condition. No change in feature condition and management of human activities is	Anticipated direction of change:	



Table 5d. Regulating services		rMCZ Broad Bench to Kimmeridge Bay
<p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock can support particularly high biodiversity (Fletcher and others, 2012).</p> <p>Natural hazard protection: The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>expected and therefore no benefit to the regulation of pollution is expected.</p> <p>Designating the recommended Marine Conservation Zone (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).</p>	 Confidence: Moderate

Table 5e. Non-use and option values		rMCZ Broad Bench to Kimmeridge Bay
Baseline	Beneficial Impact under Policy Option 1	
<p>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.</p>	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p> <p>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 the area, with common reasons being because of the 'spectacular scenery', because 'the whole place is amazing', because 'it means a great deal to me personally' and because 'it appears unspoilt'.</p>	<p>Anticipated direction of change:</p>  Confidence: Moderate

rMCZ Camel Estuary**Site area (km²): 2.2**

- This site has been proposed for designation under Policy Option 1 only.
- Based on SNCB advice, draft conservation objectives for some features have been changed from those established by the Regional Projects. The impacts of these changes on management and costs have not been reflected in this Impact Assessment.

Table 1. Conservation impacts				rMCZ Camel Estuary	
1a. Ecological description					
<p>The site encompasses the upper reaches of the Camel Estuary. The upstream portion of the recommended Marine Conservation Zone (rMCZ) overlaps with the Camel Estuary part of the Cornwall Area of Outstanding Natural Beauty and the River Camel Valley and Tributaries Site of Special Scientific Interest (SSSI). Amble Marshes SSSI is located adjacent to the rMCZ.</p> <p>The Camel Estuary is the largest and most sheltered marine inlet on the north Cornwall coast. It is predominantly shallow and sandy, deepening at the mouth, with a narrow channel at low water that meanders from one side of the estuary to the other. Water quality has been classified as grade A.</p> <p>The Camel has a large range of estuarine communities, including a variable salinity rock community, with considerable local nature conservation importance. Small patches of saltmarsh occur in the small bays and inlets, and are more extensive in the upper parts of the estuary. The estuary provides an important ecological function as a nursery area (Lieberknecht and others, 2011).</p>					
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	0.15	-	Favourable Condition	Maintained at Favourable Condition	
Intertidal coarse sediment	0.04	-	Favourable Condition	Maintained at Favourable Condition	
Intertidal mud	1.77	-	To be determined	To be determined	
SNCBs advise that the conservation objective for intertidal mud is “Maintained at Fabourable Condition”.					
Low energy intertidal rock	0.01	-	Favourable Condition	Maintained at Favourable Condition	
Habitats of Conservation Importance					

Annex I2. Impact Assessment materials (Finding Sanctuary).

Estuarine rocky habitats	-	2	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Anguilla anguilla</i>	-	-	To be determined	To be determined
SNCBs advise that the conservation objective for the European eel (<i>Anguilla anguilla</i>) is “Recover to Favourable Condition”.				

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

Table 2a. Aquaculture		rMCZ Camel Estuary
Source of costs of the rMCZ under Policy Option 1 Management scenario 1: No additional management. Management scenario 2: Compulsory use of triploid stock for Pacific oyster cultivation.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
<p>There are 2 aquaculture businesses in the Camel Estuary. The Duchy of Cornwall is the landowner, with the Padstow Harbour Commission issuing permits for operating aquaculture within the estuary.</p> <p>Pacific oysters and mussels are the only species currently cultivated within the estuary. The 2 businesses both cultivate Pacific oysters, which account for an estimated 36% of the annual volume of their combined output and 50% of the annual value of their combined output (Finding Sanctuary estimates based on information from operators).</p> <p>The majority of the current Pacific oyster cultivation is carried out using diploid stock. Both businesses have used triploid stock but with varying levels of success. One business experienced high mortality rates when triploid stocks were used. One of these businesses has used triploid stock in the past</p>	<p>Scenario 1: No costs are anticipated as a result of this scenario.</p> <p>Scenario 2: It is unlikely that the operators in the Camel Estuary would be able to source sufficient volumes of triploid seed stock to allow them to continue cultivating Pacific oysters at the current level. It is therefore expected that the operators would cease to produce Pacific oysters as a result of the management scenario that requires compulsory use of triploid stock.</p> <p>While one operator has successfully cultivated Pacific oysters using triploid stock within the estuary in the past, there is concern that triploid stock does not grow as successfully in the Camel as diploid stock. If cultivation using triploid stock could not be successfully carried out, then even if suitable supply of triploid stock could be secured, the volume of output achieved by the operators may still be significantly reduced.</p> <p>Scenario 2 is therefore expected to result in a cessation of Pacific oyster cultivation – this is</p>	

Table 2a. Aquaculture	rMCZ Camel Estuary
<p>but does not expect to use it in 2012, as cultivation of triploid stock oysters requires more labour than diploid stock. This is because the bags that the oysters are grown in have to be turned more frequently due to faster growth rates (Aquaculture operator, pers. comm., 2011).</p> <p>Recently there have been issues in sourcing supply of triploid seed stock in the UK (Aquaculture operators, pers. comm., 2011; Devon and Severn IFCA, pers. comm., 2011). Discussions with UK seed stock producers verify that there is a shortage of supply, with no immediate opportunity for its increase (Seasalter (Walney) Limited, pers. comm., 2011; Seasalter Shellfish (Whitstable) Limited, pers. comm., 2011). Supply from outside the UK is not possible due to the presence of the herpes virus in these stocks.</p>	<p>more likely to be as a result of insufficient supply rather than poor cultivation success. It should be noted that if supply could be increased, then it may be possible for Pacific oyster cultivation to continue successfully.</p> <p>Given that Pacific oyster cultivation accounts for an estimated 50% of the value of output from the aquaculture industry in the Camel Estuary, if oyster production ceased the loss of output would reduce the viability of the businesses present (Aquaculture operator, pers. comm., 2011). One operator indicated that their business could cease to be viable as a result of the compulsory use of triploid stock due to the reduction in overall revenue, thereby resulting in the loss of the operators output of other species. Whilst it may theoretically be possible for the businesses affected to increase cultivation of other species, such as mussels, clams or cockles, to off-set the losses from Pacific oysters, this was not identified as an option by the interviewed businesses.</p> <p>An estimate of the cost is not provided at the level of the rMCZ because this information is commercially sensitive and there are only a small number of businesses present. See Annex N for a cost estimate for rMCZs in the Finding Sanctuary project area and the national suite of rMCZs.</p>

Table 2b. Archaeological heritage	rMCZ Camel Estuary
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>A late medieval and 19th-century bridge is located at Wadebridge. The remains of 3 hulked wrecks are located in the intertidal zone at Cant Cove, St Minver. It is not clear if these are located in the site (English Heritage, pers.</p>	<p>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 as a result of this rMCZ has been estimated. However, the additional cost in one</p>

Table 2b. Archaeological heritage		rMCZ Camel Estuary
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
comm., 2012).	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 2c. Flood and coastal erosion risk management (coastal defence)		rMCZ Camel Estuary
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
The 0 to 20 year Shoreline Management Plan policies along the landward edges of the rMCZ are predominantly to 'hold the line', with some areas of 'no active intervention'. The Amble Marshes scheme is anticipated within the next 5 years and additional 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 Camel Estuary	
Source of costs of the rMCZ under Policy Option 1			
Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for navigational dredging within 1km of the rMCZ. It is not anticipated that any additional mitigation, relative to mitigation provided under 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. Additional costs incurred in updating existing Maintenance Dredging Protocols (MDPs) and implementing new MDPs for ports that do not currently have one in place. 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 under Policy Option	
<u>Navigational dredging:</u> Padstow Harbour is located a few miles to the west 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 takes place 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).	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.000	0.003*
<u>Harbour development:</u> Padstow Harbour is the only harbour within 5km of the rMCZ. There are no known harbour plans for developments at Padstow Harbour.	*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.		
	Scenario 1: No costs are anticipated under this scenario.		
	Scenario 2:		
	<u>Navigational dredging:</u> Under this scenario, future licence applications for navigational maintenance dredging at Padstow Harbour 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 over the IA 20 year timeframe. No additional mitigation, above that required under the baseline, is anticipated.		
	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.		

Table 2d. Ports, harbours, shipping and disposal sites	rMCZ Camel Estuary
	<p><i>Harbour development:</i> 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.</p>

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Camel Estuary
Recreation; research and education; water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale⁴</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in</p>	rMCZ Camel Estuary
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⁴ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex 12. Impact Assessment materials (Finding Sanctuary).

the table, more detail is provided in the narrative.									
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
Coastal salt marshes and saline reedbeds	BSH	✓	✓	✓	None	Maintain			
Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
Intertidal mud	BSH	□	□	□	None	Maintain			
Low energy intertidal rock	BSH	✓	✓	□	None	Maintain			
Estuarine rocky habitats	FOCI Habitat	✓	✓	□	None	Maintain			
European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	✓	N/A	None	<i>Maintain/ Recover</i> * 5	This feature is not protected in any existing MPAs within the SW region, therefore, MCZ designation is needed to meet the minimum ENG target for replication	The eel is a UK BAP priority species and IUCN red data book listed.	The eel is a UK BAP priority species and IUCN red data book listed.
Site considerations									

Annex I2. *Impact Assessment materials (Finding Sanctuary).*

Connectivity	✓
Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Area of Additional Ecological Importance	✓
Overlaps with existing MPAs	✓

Additional comments and site benefits:

The Camel has a large range of estuarine communities, for example, variable salinity rock community, with considerable local nature conservation importance (J. Davies 1998).

Detailed evidence/data to demonstrate the important fish nursery area function of the Camel estuary and their supporting FOCI habitats of mudflats and salt marsh has been provided to the regional project (SAD in (Lieberknecht, et al. 2011)).

Water quality has been classified as grade A (Buck 1997).

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 5a. Fish and shellfish for human consumption		rMCZ Camel Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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.</p> <p>However, there is currently no commercial fishing within the rMCZ and therefore no value derived from on-site fisheries. It has not been possible to estimate the value derived from off-site fisheries as a result of the nursery area function.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence : Moderate</p>

Table 5b. Recreation		rMCZ Camel Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 estuary is a nursery area for fish (Environment Agency, pers. comm.,</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Table 5b. Recreation	rMCZ Camel Estuary	
<p>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.</p> <p>Light tackle fishing occurs in the sheltered waters of the Camel Estuary. It has not been possible to estimate the value of angling in the site.</p>	<p>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).</p> <p>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.</p>	<p>Confidence: Moderate</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	<p>N/A</p>	<p>N/A</p>
<p>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.</p> <p>Large areas of saltmarsh encourage a variety of winter waders at the Camel Estuary. Bird watching is popular here; little egrets, peregrines, mute swans and several types of duck, including shelducks, shovelers, teal and mallards, are seen in the rMCZ. Birds known to tour here include the northern lapwing and the European golden plover. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ Camel Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>Research activities are carried out in and around the rMCZ in relation to the existing designations in the area. This includes the Cornwall Area of Outstanding Natural Beauty (AONB) Landscape Monitoring Project. The full extent of current research activity carried out in the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The extent of existing education activities in and around the rMCZ is unknown; however, there may be links to wider programmes related to the surrounding Sites of Special Scientific Interest and Cornwall AONB. It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	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).	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Camel Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 <i>Spartina anglica</i> which grows in intertidal mud (Fletcher and others, 2011; 2012).</p>	<p>If the conservation objectives are achieved, the features of the site will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>Designating the recommended Marine Conservation Zone (rMCZ) will protect</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Table 5d. Regulating services		rMCZ Camel Estuary
<p>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).</p> <p>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).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	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 5e. Non-use and option values		rMCZ Camel Estuary
Baseline	Beneficial impact under Policy Option 1	
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.	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p> <p>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 the area, with reasons including because of the 'spectacular scenery' and because 'it appears unspoilt'.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Cape Bank**Site area (km²): 472.8**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts				rMCZ Cape Bank
1a. Ecological description				
<p>The site includes the Cape Bank section of the Land’s End and Cape Bank candidate Special Area of Conservation. The site’s south-westerly position on the British coast means that the sublittoral zone is exposed to the full force of the waves and oceanic swells coming in from the Atlantic, as well as experiencing full salinity, given the absence of any major source of fresh water run-off from the land. The recommended Marine Conservation Zone intersects an area of added ecological importance for the pelagic realm, with frontal activity and summer foraging birds, including sea bird colonies from the Isles of Scilly such as kittiwakes, puffins, guillemots and razorbills. Fin whales are present in the area in winter.</p> <p>The crescent-shaped system of offshore upstanding rocky reefs forms the major Feature of Conservation Importance in the Cape Bank site. It measures about 35km along its central spine and 12km at its widest point. The outer part of Cape Bank is characterised by at least three sub-parallel, high linear rock ridges which extend for over 20km in a slightly curving south to north-north-east trending arc. These ridges sit on a rock platform at a depth of 45–55 metres; they can reach up to 25 metres in height and can be more than 1km wide. With steep slopes, they cover an area of over 100km².</p> <p>The reef is characterised by high biodiversity tide-swept communities such as sponges, faunal and algal turfs and crustose communities. The offshore upstanding rocky reef areas are the most biodiverse of all the rocky reef habitats within the site. The most abundant biotope in this area is <i>Caryophyllia smithii</i> and sponges, with <i>Pentapora foliacea</i>, <i>Porella compressa</i> and crustose communities on wave-exposed circalittoral rock (Lieberknecht and others, 2011).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Moderate energy circalittoral rock	19.50	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal coarse sediment	308.11	-	Unfavourable Condition	Recover to Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Palinurus elephas</i>	-	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 Cape Bank
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
The site contains the wreck of a Scottish cargo vessel (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 Cape Bank
Source of costs of the rMCZ under Policy Option 1	
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 2b. Commercial fisheries		rMCZ Cape Bank							
Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges; no removal of crawfish (<i>Palinurus elephas</i>) from the rMCZ.									
Management scenario 3: Closure of entire rMCZ to bottom trawls and dredges; closure of area of moderate energy circalittoral rock 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 under Policy Option 1							
<p>Overview: The rMCZ extends from inside the 6nm (nautical mile) limit to outside the 12nm limit and is fished by vessels from the UK, France and Belgium. The rMCZ provides significant landings revenue for most types of fishing, particularly potting. There are high levels of French and Belgian bottom trawl effort, principally in the western half of the rMCZ over the softer sediments. There is some UK beam trawl and otter trawl activity, which occurs on a seasonal basis. It is not currently a notable scallop dredging area. Netting, hand lining and potting is commonplace over the harder ground, principally in the east of the rMCZ. The Trevoise closure, the Wave Hub renewable energy development, and the Land's End and Cape Bank Special Area of Conservation (SAC) as well as Inshore Fisheries and Conservation Authority (IFCA) byelaws (see Annex E for further details) all restrict, or are expected to restrict, fishing patterns in or near the rMCZ.</p> <p>Estimated total value of UK vessel landings from the rMCZ: £0.635m/yr.</p>									
<p>UK Dredges: The rMCZ does not cover a known scalloping ground and the level of dredging in the rMCZ is currently very low. There has, however, historically been dredging in the area (Scallop dredge owner, pers. comm., 2011). Estimated value of UK dredge landings from the rMCZ: £0.005m/yr.</p>		<p>Scenario 1: No impacts are anticipated under this scenario.</p>							
		<p>Scenario 2: The rMCZ is not currently a regular scalloping ground and average landings from it are low. While displacement of effort in response to closure to dredging is therefore expected to be limited under this scenario, it should be noted that the closure will remove a potential fishing ground option from the fleet.</p> <p>Estimated annual value of UK dredge landings affected is expected to fall within the following range:</p>							
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.005
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4					
Value of landings affected	0.000	0.005	0.005	0.005					

Table 2b. Commercial fisheries		rMCZ Cape Bank				
<p>UK Bottom trawls: A number of beam trawlers and otter trawlers fish in the area. The beam trawls principally target Dover sole, and otter trawls target a range of species including sole, monkfish, john dory, squid, skate and haddock. For beam trawlers in particular the area is an important alternative sole fishery to that on the south coast, being in the International Council for the Exploration of the Sea (ICES) Area VII_f rather than VI_{le}, as the availability of sole quota is far greater in ICES Area VII_f.</p> <p>Beam trawling generally, although not exclusively, occurs along the western and northern edges of the rMCZ (MCZ Fisheries Model). The ground is particularly important for the 4 metre beam fleet, with estimates of 40% of some vessels' landings coming from the wider area (Ghey, 2007). Otter trawling mainly occurs to the south and north east of the rMCZ (MCZ Fisheries Model). In addition, UK and French trawlers often tow up through the rMCZ on their way to north coast fishing grounds (Otter trawl skipper, pers. comm., 2011).</p> <p>The area is fished year-round and, during January, February and March when the Trevoise closure is in force, vessels cannot fish north of 50.5 degrees. This concentrates effort in the area south of the Trevoise closed area between the north-eastern edges of the rMCZ and the Cornish coast.</p> <p>The expected closure to trawling in the area of the Wave Hub development will further concentrate this fishing effort in the area and may result in an increase in effort in the rMCZ.</p> <p>Estimated value of UK bottom trawl landings from the rMCZ: £0.085m/yr.</p>	<p>Scenario 1: No impacts are anticipated under this scenario.</p> <p>Scenario 2: Under this scenario, beam trawlers are expected to continue to target sole in the area, particularly between January and March. However, the rMCZ closure will squeeze the area available to trawlers during this period, which is when the Trevoise Closure is in force. This will result in further concentration of effort in an already intensively fished area, which may affect fishers' catch rates (Beam trawl skipper, pers. comm., 2011). For beam trawlers, this could increase the difficulty that they have in catching their Dover sole quota for ICES Area VII_f.</p> <p>Vessels from south coast ports that currently trawl through the rMCZ will need to steam through the rMCZ on their way to and from north coast fishing grounds rather than tow. For a typical Newlyn 20 metre otter trawler, this could add around 8 hours of unproductive steaming time in both directions for trips to the north coast fisheries, resulting in additional fuel costs and loss of revenue (Otter trawl skipper, pers. comm., 2011).</p> <p>Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:</p>					
<p>UK Pots and traps: There is a significant level of potting throughout the rMCZ and wider area. Up to 5 (Cornish Fish Producers Organisation (CFPO), pers. comm., 2011) large (over 15 metre) Cornish vessels working up to 1,200 pots (Ghey, 2007) operate nomadically in an area between the south west of the rMCZ and north of Newquay, including in the rMCZ.</p> <p>Smaller vessels (around 10 metres) work between 600 and 800 pots in semi-</p>	<p>Scenario 1: No impacts are anticipated under this scenario.</p> <p>Scenario 2: A prohibition of crawfish landings from within the rMCZ is not expected to reduce the viability of potting in the Cape Bank/Bann Shoal area. This is because crawfish landings make up approximately 5% of the value of landings by potters from the rMCZ. However, the high value of crawfish makes it an important species in the mix of fish caught and can make up an important element of a fisher's landings.</p>					

Table 2b. Commercial fisheries	rMCZ Cape Bank										
<p>fixed areas, running from inside the rMCZ towards the coast of north Cornwall, for brown crab and lobster. Their effort is concentrated between March and October, starting once the main trawling effort in the area disperses (Ghey, 2007).</p> <p>Pots area used in the area principally to target lobster and crab, and occasionally crawfish.</p> <p>Estimated value of UK pot and trap landings from the rMCZ: £0.357m/yr.</p> <p>Crawfish are not the principal target species for potters but are particularly valuable.</p> <p>Modelled estimates of the value of UK pot and trap crawfish landings from the rMCZ are £0.006m/yr.</p> <p>The underlying FisherMap data for the Cornish inshore area used in the MCZ Fisheries Model do not allow for species-specific analysis. To address this, an alternative estimate has been provided which reflects the greater likelihood of catching crawfish in the rMCZ over the rocky habitat of the Bann Shoal and Cape Bank. This alternative method assumes that:</p> <p>(i) the wider fishery (covering ICES Rectangle 29E4) is the source of approximately 27% of the value of all UK crawfish landings, 21% (£0.019m/yr) of which are caught by potters (MMO, 2011a)</p> <p>(ii) all crawfish landings by pots and traps from ICES Rectangle 29E4 occur over the areas of rock habitat around the Cape Bank and Bann Shoal, 95% of which is inside the rMCZ (calculations based on EUNIS Level 3 broad-scale habitat mapping).</p> <p>Based on these assumptions, the value of crawfish landings by potters from the rMCZ is estimated to be £0.018m/yr. This estimate is employed for the analysis to avoid underestimation of costs.</p>	<p>Scenarios 3 and 4: A zoned closure or full closure of the rMCZ would significantly impact on the revenues of the (up to) 5 affected vessels and potentially the viability of their businesses. Displaced fishers are likely to have to increase their effort in other fishing grounds and/or switch to other gear types.</p> <p>Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:</p> <table><tr><th>£m/yr</th><th>Scenario 1</th><th>Scenario 2</th><th>Scenario 3</th><th>Scenario 4</th></tr><tr><td>Value of landings affected</td><td>0</td><td>0.018</td><td>0.323</td><td>0.357</td></tr></table> <p>If the SAC results in restrictions to fishing with pots and traps, then this may reduce the potential impact of the rMCZ.</p> <p>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.</p>	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0	0.018	0.323	0.357
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4							
Value of landings affected	0	0.018	0.323	0.357							

Table 2b. Commercial fisheries		rMCZ Cape Bank													
<p>UK Nets: Netting occurs throughout the rMCZ with the heaviest intensity in the eastern part of the rMCZ over the hard ground of the Cape Bank and Bann Shoal, which extends from just to the north of the rMCZ through to just to the south.</p> <p>Fewer than 5 vessels regularly fish using nets in the rMCZ (Netter skipper, pers. comm., 2011). Overall, at least 7 vessels fish there occasionally in any given year (Hand line skipper, pers. comm., 2011). The vessels fish multiple gears, but principally use tangle nets within the rMCZ. Netting is only possible during periods of settled weather due to the boat sizes and distance of the rMCZ from shore, and therefore normally occurs during the summer.</p> <p>Estimated value of UK net landings from the rMCZ: £0.088m/yr.</p> <p>Crawfish are targeted from mid-May through to September/October, typically on neap tides using tangle nets (Netter skipper, pers. comm., 2011). Access to the fishing ground is weather-dependent although nets are constantly fishing as they are hauled and re-shot in a single trip. The high value of crawfish means that even low catch rates are important to the viability of fishers' businesses, particularly during the summer months (Netter skipper, pers. comm., 2011).</p> <p>Modelled estimate of value of UK netted crawfish landings from the rMCZ: £0.005m/yr.</p> <p>The importance of the crawfish fishery identified through discussions with fishers and fisheries representatives indicates that this may be an underestimate. In addition, the underlying FisherMap data for the Cornish inshore area used in the MCZ Fisheries Model does not allow for species-specific analysis. To address this, an alternative estimate has been provided which reflects the preference for netters to target crawfish on the rocky habitat of the Bann Shoal and Cape Bank. The alternative method used assumes that:</p> <p>(i) the wider fishery (covering ICES Rectangle 29E4) is the source of nearly</p>	<p>Scenario 1: No impacts are anticipated under this scenario.</p> <p>Scenario 2: A prohibition of crawfish landings from within the rMCZ would significantly reduce the viability of netting in the Cape Bank/Bann Shoal area (Netter skipper, pers. comm., 2011). Displaced fishers are likely to have to increase their effort in other fishing grounds and/or switch to other gear types.</p> <p>Scenarios 3 and 4: A zoned closure or full closure of the rMCZ would significantly impact on the revenues of the (up to) 5 affected vessels and potentially the viability of their businesses. Displaced fishers are likely to have to increase their effort in other fishing grounds and/or switch to other gear types (Netter skipper, pers. comm., 2011).</p> <p>Estimated annual value of UK net landings affected is expected to fall within the following range:</p>														
	<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</td><td>0.064</td><td>0.072</td><td>0.088</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0	0.064	0.072	0.088
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4										
	Value of landings affected	0	0.064	0.072	0.088										
	<p>Scenarios 2, 3 and 4 will significantly affect the viability of affected fishers' businesses, particularly during the summer months when their fishing effort is focused on the Bann Shoal and Cape Bank area (Netter skipper, pers. comm., 2011). It is unlikely that vessels could adequately increase effort in their other grounds or use other gear types as the Cape Bank fishing ground is their principal summer fishery. Other grounds and use of other gear types are more suited to other seasons (netter skipper, pers. comm., 2011).</p>														
<p>The loss of landings from the rMCZ will significantly impact on each vessel's total landings during the summer. If they are unable to adapt their fishing patterns, it is likely that their businesses would no longer be considered viable on a full-time basis and the rMCZ would thereby affect a significantly higher value of landings.</p>															
<p>If the SAC results in restrictions to fishing with nets, then this may reduce the potential impact of the rMCZ.</p>															
<p>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</p>															

Table 2b. Commercial fisheries	rMCZ Cape Bank										
<p>27% of the value of all UK crawfish landings, 76% (£0.067m/yr) of which are caught by netters (MMO, 2011a);</p> <p>(ii) all crawfish landings by nets from ICES Rectangle 29E4 occur over the areas of rock habitat around the Cape Bank and Bann Shoal, 95% of which is inside the rMCZ (calculations based on EUNIS Level 3 broad-scale habitat mapping).</p> <p>Based on these assumptions, the value of crawfish landings by netters from the rMCZ is estimated to be £0.064m/yr. This estimate is employed for the analysis to avoid underestimation of costs.</p>	<p>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.</p>										
<p>UK Hooks and lines: The wider Cape Bank and Bann Shoal area is regularly fished by at least 7–12 day-boat vessels from Hayle and St Ives (Two hand line skippers, pers. comm., 2011). The rMCZ is situated within this fishing ground. In summer 2011, the mackerel catch was relatively poor and this resulted in increased numbers of hand liners (more than 20) choosing to target pollack in that fishing ground, including within the rMCZ (Hand line skipper, pers. comm., 2011). The vessels using hooks and lines typically fish more than one gear type.</p> <p>Activity in the rMCZ is limited to when weather conditions are suitable, which is typically during the summer. Hand liners target pollack in the rMCZ and wider Bann Shoal and Cape Bank fishing ground, with cod as occasional bycatch. Regular fishers in the rMCZ also occasionally target mackerel and bass in grounds close inshore (outside the rMCZ) around St Ives and Land’s End, while occasional fishers in the rMCZ primarily fish on the mackerel and bass grounds (Hand line skipper, pers. comm., 2011).</p> <p>Modelled estimated value of UK hook and line landings from the rMCZ: £0.063m/yr.</p> <p>The importance of the fishery identified through discussions with fishers and fisheries representatives indicates that this may be an underestimate as the pollack fishing ground is focussed on the hard ground within the rMCZ (Hand</p>	<p>Scenarios 1 and 2: No impacts are anticipated under this scenario.</p> <p>Scenarios 3 and 4: The Bann Shoal and Cape Bank fishing ground, which is the focus of hand line fishing effort in the rMCZ, is covered by the closed areas of both scenarios. As such, the impacts under each scenario are expected to be the same.</p> <p>Closure of the rMCZ to hooks and lines is expected to remove the majority of the total fishing income earned by the at least 7–12 regular hand line vessels that fish in the rMCZ. As the rMCZ covers approximately 95% of the Bann Shoal and Cape Bank fishing ground, the affected vessels will have to move to new fisheries, such as the nearshore mackerel and bass fishery, or increase their effort using other gear types. If these vessels are not able to successfully adapt then the closure is likely to make their businesses unviable.</p> <p>For vessels that occasionally hand line in the rMCZ, the closure will remove an important occasional summer fishery, which allows them to maintain a good level of landings value in years when mackerel catches are poor (such as in 2011).</p> <p>The estimated annual value of UK hook and line landings affected is expected to fall within the following range:</p> <table><tr><th>£m/yr</th><th>Scenario 1</th><th>Scenario 2</th><th>Scenario 3</th><th>Scenario 4</th></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.100</td><td>0.100</td></tr></table> <p>If the SAC results in restrictions to fishing with hooks and lines, then this may reduce the potential impact of the rMCZ.</p>	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	0.100	0.100
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4							
Value of landings affected	0.000	0.000	0.100	0.100							

Table 2b. Commercial fisheries	rMCZ Cape Bank
<p>line skippers, pers. comms., 2011) Visual analysis of a regular Bann Shoal and Cape Bank hand line vessel's waypoints (specific places where the vessel fishes) showed a concentration of fishing marks following the hard ground of the Bann Shoal and Cape Bank, inside the rMCZ, which define the fishing ground. The rMCZ covers approximately 95% of the fishing ground (calculation based on the area of circalittoral rock in EUNIS Level 3 habitat mapping that is over the Bann Shoal and Cape Bank area).</p> <p>In addition, there is low confidence in the underlying FisherMap data for the Cornish inshore area used in the MCZ Fisheries Model. (This is because the underlying FisheMap data do not distinguish between fishing using pots and traps, nets, and hooks and lines).. As fishing effort with nets and, in particular, with pots and traps is less focused on the rocky area of the Bann Shoal and Cape Bank, analysis based on the FisherMap data is therefore likely to underestimate the level of effort by hook and line vessels that takes place over the rocky area. To address this, an alternative estimate has been provided which reflects the preference for hand liners to target pollack on the rocky habitat of the Bann Shoal and Cape Bank. The alternative method uses the following assumptions:</p> <p>(i) The Cape Bank and Bann Shoal fishing ground is thought to account for the vast majority of hand-line-caught pollack from ICES Rectangle 29E4 (Two hand line skippers, pers. comm., 2011). It is assumed that 80% (an arbitrary figure based on information provided by a hand line skipper (pers. comm., 2011)) of the value of pollack landings from ICES Rectangle 27E4, which averaged £0.095m/yr between 2007 and 2010 (MMO, 2011a), are from the hard ground of the Bann Shoal and Cape Bank.</p> <p>(ii) 95% of vessel landings from the Bann Shoal and Cape Bank fishing ground are from within the rMCZ. This is calculated as the percentage of the area of circalittoral rock over the Bann Shoal and Cape Banks area shown in EUNIS Level 3 habitat mapping which is within the rMCZ.</p>	<p>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.</p>

Table 2b. Commercial fisheries		rMCZ Cape Bank																							
<p>(iii) Pollack accounts for 90% of the value of landings by hand liners from the Bann Shoal and Cape Bank fishing ground. This is based on analysis of landings by a single vessel that works principally in the Bann Shoal and Cape Bank fishing ground (MMO, 2011a).</p> <p>Alternative estimated value of UK hook and line landings from the rMCZ: £0.100m/yr. This estimate is employed for the analysis to avoid underestimation of costs.</p>																									
Total direct impact under Policy Option 1																									
<p>Total direct impact on UK commercial fishing</p>		<p>Estimated annual value of UK vessel landings and gross value added (GVA) affected are expected to fall within the following range:</p> <table><tr><th>£m/yr</th><th>Scenario 1</th><th>Scenario 2</th><th>Scenario 3</th><th>Scenario 4</th><th>Best estimate</th></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.172</td><td>0.585</td><td>0.635</td><td>0.045</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.075</td><td>0.285</td><td>0.309</td><td>0.022</td></tr></table> <p>If the SAC results in restrictions to fishing, then this may reduce the potential impact of the rMCZ.</p> <p>The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.</p>						£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate	Value of landings affected	0.000	0.172	0.585	0.635	0.045	GVA affected	0.000	0.075	0.285	0.309	0.022
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate																				
Value of landings affected	0.000	0.172	0.585	0.635	0.045																				
GVA affected	0.000	0.075	0.285	0.309	0.022																				
<p>Impact on non-UK commercial fishing: Non-UK vessels (French and Belgian) using static gears, bottom trawls/dredges and mid-water trawls fish within the rMCZ (Lee, 2010). There are 14 French vessels of over 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 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.,</p>		<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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: £0.205m/yr (bottom trawls/dredges) and £0.005m/yr (static gears). No information on the effect of the prohibition of crawfish removal, the zoned closure to static gears or the value of landings affected for Belgian vessels is available.</p>																							

Table 2b. Commercial fisheries		rMCZ Cape Bank
2011).		
Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.205m/yr; static gears: £0.005m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.		

Table 2c. National defence		rMCZ Cape Bank
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
MOD is known to make use of the rMCZ for water column activities.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex O and the Evidence Base (they are not assessed for this rMCZ alone).	

Table 2d. Renewable energy		rMCZ Cape Bank
Source of costs of the rMCZ under Policy Option 1		
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 2d. Renewable energy		rMCZ Cape Bank	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1		
Tidal energy: The rMCZ overlaps with the Land’s End coastal tidal energy Potential Development Area (PDA) (PMSS, 2010). Any potential installation could have a footprint within the PDA of 5km ² (PMSS, 2010) covering 2.6% of the PDA. The rMCZ covers 6.7% 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 potential energy installation is anticipated in the PDA, with the associated licence application expected in 2030 (Department of Energy and Climate Change (DECC), pers. comm., 2011). The development in the PDA is expected to have a production capacity of 150MW (PMSS, 2010).	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	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 tidal 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 £0.012m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex O 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 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 H13 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.		
	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
Wave energy: The rMCZ overlaps with the Isles of Scilly wave energy PDA. Any likely installation in the Isles of Scilly PDA could have a footprint within the PDA of 40km ² , covering 1.6% of the PDA (PMSS, 2010). The rMCZ covers 3.2% of the PDA. As the location of the potential installation is not			

Table 2d. Renewable energy		rMCZ Cape Bank	
known, the possible overlap of 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 (DECC, pers. comm., 2011). The development in the PDA is expected to have a production capacity of 400MW by 2030 (PMSS, 2010).	Cost to the operator	0.013	At least 0.013
	<p>Scenario 1: Assuming that the potential future 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 £0.013m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex O for details).</p> <p>Scenario 2: In addition to the costs set out under scenario 1, further costs may occur under Scenario 2 if use of removable frond mattressing for cable protection is required to mitigate the impacts of scour protection. . As the actual location of the potential installation is unknown, it is unclear whether any cables will need to 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 H13 for details) and, as such, the total mitigation cost could be significant. However, the likelihood and magnitude of any additional costs cannot be calculated.</p>		

Table 2e. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Cape Bank
<p>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).</p> <p>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).</p>	

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Cape Bank
Cables (existing interconnectors and telecom cables)	
Commercial fisheries (mid-water trawls); recreation	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale⁵</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>									rMCZ: Cape Bank
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓	None	Recover			

⁵ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex 12. Impact Assessment materials (Finding Sanctuary).

A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Recover	This BSH is currently only reaching the minimum adequacy target	This BSH is currently only reaching the minimum adequacy target	
Spiny lobster <i>Palinurus elephas</i>	FOCI Species	✓ * ¹	✓	✓	None	Recover	This FOCI is currently only reaching the minimum replication target.	This feature is not protected in any existing MPAs within the SW region.	This feature is not protected in existing MPAs (in Western Channel and Celtic Sea) - Region 4.
Site considerations									
Connectivity				✓ * ²					
Geological/Geomorphological features of interest				✓ * ⁴					
Appropriate boundary				✓					
Areas of additional ecological importance				✓ ³					
Overlaps with existing MPAs				✓					

rRA FS 12 Cape Bank within rMCZ 36 Cape Banks. An overview of features proposed for designation within rRA Cape Banks and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale

✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Where an asterisk (*) has been given in the table, more detail is provided in the narrative.

ENG Feature	Representativity	Viability	Recommended conservation objective
A4.1 High energy circalittoral rock * ⁵	BSH	✓	Recover to reference condition
A3.1 High energy infralittoral rock * ⁵	BSH	✓	Recover to reference condition
A4.2 Moderate energy circalittoral rock * ⁵	BSH	✓	Recover to reference condition
A3.2 Moderate energy infralittoral rock * ^{5, 6}	BSH	✓	Recover to reference condition
A5.1 Subtidal coarse sediment	BSH	✓	Recover to reference condition
Spiny lobster <i>Palinurus elephas</i> * ²	FOCI Species	✓	Recover to reference condition
Pink sea-fan <i>Eunicella verrucosa</i> * ¹	FOCI Species	✓	Recover to reference condition
Site considerations			

Appropriate boundary	✓
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Additional comments and site benefits:

- Natural England survey work (Natural England 2010c) shows the FOCI habitat 'Fragile sponge and anthozoan communities on subtidal rocky habitats' is also present in the area (within the cSAC). These may also be present outside the cSAC boundary, where there is additional rocky habitat, in which case the rMCZ would contribute additional protection (SAD in (Lieberknecht, et al. 2011)).
- ¹There is evidence that *Palinurus elephas* is in unfavourable condition in all SW waters (Goñi and Latrouite 2005). It has a limited distribution nationally, and is not protected in any existing MPAs within the SW region, therefore the MCZ designation is needed to meet the minimum ENG target for replication.
- ²This site is needed to improve connectivity of the Finding Sanctuary Regional Project Area, and more specifically for sediment habitats.
- Cape Bank rMCZ encompasses Land's End and Cape Bank cSAC which protects additional features to the rMCZ.
- The rMCZ and rRA are an area of productive tidal fronts. Local group feedback indicates that this area is an area of additional ecological importance for the pelagic realm due to the frontal activity, and used by summer foraging birds (SAD in (Lieberknecht, et al. 2011)), and other mobile species.
- There are records of sightings of basking sharks (Marine Conservation Society and Shark Trust data). This rMCZ falls within the foraging radii for seabird colonies (RSPB data) and there are also nursery and spawning grounds for a number of fish species (Ellis, et al. 2012).
- ⁴ Although this site does not have any primary geological or geomorphological features of interest, the rMCZ does host some secondary features such as the maximum lateral extent of the ice during the last glacial period and contains topographic features such as seabed mounds or pinnacles
- **rRA 12:** ⁵ This feature is also present in the cSAC, and evidence shows it to be of high conservation value. (Natural England 2010c)
- **rRA 12:** ⁶ This is the only replicate of BSH Moderate Energy Infralittoral rock within the recommendations; however the feature is also protected by the Land's End and Cape Bank cSAC.
- **rRA 12:** This is the only reference area proposed for this feature in the national network., and the feature has a limited national distribution.
- **rRA 12:** The reef is characterised by high biodiversity tide-swept communities such as sponges, faunal and algal turfs and crustose communities (SAD in (Lieberknecht, et al. 2011)).
- **rRA 12:** This site has a strong evidence base for the reef features, due to survey work undertaken by Natural England (Natural England 2010c).

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 5a. Fish and shellfish for human consumption		rMCZ Cape Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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 provides a firm substrate for species attachment and important inshore crab and lobster fisheries, and subtidal coarse sediment helps to support a number of fisheries (Fletcher and others, 2012). Crawfish <i>Palinurus elephas</i> is a commercially targeted species. 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.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, the costs of which are set out in Table 2b.</p> <p>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.</p> <p>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. Crawfish stocks may also improve and, depending on whether targeting of crawfish is permitted within the rMCZ, on-site and/or off-site spill-over benefits may occur.</p> <p>If rMCZ 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.</p> <p>The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision or the off-site impacts of displaced effort.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence : Low</p>

Table 5b. Recreation		rMCZ Cape Bank
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ: Cape Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The rMCZ overlaps a Special Area of Conservation and research activities may occur in relation to the designation.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ Cape Bank
Baseline	Beneficial impact under Policy Option 1	

Table 5d. Regulating services		rMCZ Cape Bank
<p>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).</p> <p>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 can support particularly high levels of biodiversity (Fletcher and others, 2012).</p> <p>Natural hazard protection: As the site is offshore, it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives are achieved, the features of the site will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Cape Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p> <p>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 'the undersea plants and animals'.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area Cape Bank**Site area (km²): 25.0**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts			rMCZ Reference Area Cape Bank	
1a. Ecological description				
<p>The site includes the Cape Bank section of the Land's End and Cape Bank candidate Special Area of Conservation. The site's south-westerly position on the British coast means that the sublittoral zone is exposed to the full force of the waves and oceanic swells coming in from the Atlantic, as well as experiencing full salinity, given the absence of any major source of fresh water run-off from the land. The recommended Marine Conservation Zone (rMCZ) intersects an area of added ecological importance for the pelagic realm, with frontal activity and summer foraging birds, including sea bird colonies from the Isles of Scilly such as kittiwakes, puffins, guillemots and razorbills. Fin whales are present in the area in winter.</p> <p>The crescent-shaped system of offshore upstanding rocky reefs forms the major Feature of Conservation Importance. It measures about 35km along its central spine and 12km at its widest point. The rMCZ covers an area of 5km² and the site's depth range is between 35 metres and 60 metres below sea level. The reef is characterised by high biodiversity tide-swept communities such as sponges, faunal and algal turfs and crustose communities. The offshore upstanding rocky reef areas are the most biodiverse of all the rocky reef habitats within the site. The most abundant biotope in this area is Devonshire cup coral <i>Caryophyllia smithii</i> and sponges, with <i>Pentapora foliacea</i>, <i>Porella compressa</i> and crustose communities on wave-exposed circalittoral rock (Lieberknecht and others, 2011).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
High energy circalittoral rock	0.42	-	Unfavourable Condition	Recover to Reference Condition
High energy infralittoral rock	0.70	-	Unfavourable Condition	Recover to Reference Condition
Moderate energy circalittoral rock	20.59	-	Unfavourable Condition	Recover to Reference Condition
Moderate energy infralittoral rock	0.69	-	Unfavourable Condition	Recover to Reference Condition
Subtidal coarse sediment	2.60	-	Unfavourable Condition	Recover to Reference Condition
<i>Species of Conservation Importance</i>				
<i>Euincella verrucosa</i>	-	1	Unfavourable Condition	Recover to Reference Condition

<i>Palinurus elephas</i>	-	1	Unfavourable Condition	Recover to Reference Condition
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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 Cape Bank
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p> <p>Management scenario 1: Closure of entire rMCZ to all commercial fishing, except mid-water trawls.</p> <p>Management scenario 2: Closure of entire rMCZ to all commercial fishing.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
<p>Overview: The rMCZ is situated between the 6nm (nautical mile) and 12nm limits and is fished by vessels from the UK, France and Belgium. Due to the rocky nature of the habitat within the rMCZ, there is very limited activity by bottom trawls. Potting, netting and hand lining are commonplace throughout the rMCZ, with fishers particularly targeting the hard ground of the Cape Bank and Bann Shoal areas. There are a number of existing restrictions on fishing in the rMCZ (see Annex E). In addition, the Land's End and Cape Bank Special Area of Conservation (SAC) may restrict fishing activity within the rMCZ. Estimated total value of UK vessel landings from the rMCZ: £0.058m/yr.</p>		

Table 2a. Commercial fisheries	rMCZ Reference Area Cape Bank								
<p>UK Bottom trawls: The rMCZ does not cover a known bottom trawling ground and the rocky nature of the area makes fishing unlikely to occur. Estimated value of UK bottom trawl landings from the rMCZ: £0.002m/yr.</p>	<p>Scenarios 1 and 2: The rMCZ covers an area of ground thought not to be suitable for trawling, and average annual landings from it are estimated to be low. No significant impacts are therefore anticipated.</p> <p>Estimated annual value of UK vessel bottom trawl landings affected is expected to fall within the following range:</p> <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> <p>If the SAC results in restrictions to fishing with bottom trawls, then this may reduce the potential impact of the rMCZ.</p>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.002	0.002
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.002	0.002							
<p>UK Pots and traps: There is a significant level of potting throughout the rMCZ and wider area. Up to 5 (Cornish Fish Producers Organisation (CFPO), pers. comm., 2011) large (over 15 metre) Cornish vessels working up to 1,200 pots (Ghey, 2007) operate nomadically in an area from within the rMCZ to north of Newquay. Estimated value of UK pot and trap landings from the rMCZ: £0.022m/yr.</p>	<p>Scenarios 1 and 2: The rMCZ will displace affected fishers who employ pots and traps to other parts of the fishing ground described in the baseline. This may affect catch rates and, given the large number of pots worked by the vessels, may increase conflict with other gear types and with smaller potters working in other areas.</p> <p>Estimated annual value of UK vessel pot and trap landings affected is expected to fall within the following range:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.022</td><td>0.022</td></tr></table> <p>If the SAC results in restrictions to fishing with pots and traps, then this may reduce the potential impact of the rMCZ.</p>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.022	0.022
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.022	0.022							
<p>UK Nets: There is a significant level of netting throughout the rMCZ and wider area. Fewer than 5 vessels regularly fish in the rMCZ (Net skipper, pers. comm., 2011). At least 7 vessels fish in the rMCZ occasionally in any given year (Hand line skipper, pers. comm., 2011). The vessels fish multiple gears but principally use tangle nets within the rMCZ. Fishing is only possible during periods of settled weather due to the boat sizes and distance from</p>	<p>Scenarios 1 and 2: The rMCZ would reduce the viability of netting in the Bann Shoal and Cape Bank fishing ground. Displaced fishers may increase their effort in the remainder of the ground, in other fishing grounds and/or switch to other gear types.</p> <p>The location of the rMCZ in the middle of the Bann Shoal and Cape Bank fishing ground may increase steaming time and reduce landings for vessels that fish the ground if they need to move their fishing effort between the northern and southern parts of the fishing</p>								

Table 2a. Commercial fisheries		rMCZ Reference Area Cape Bank							
shore, and therefore normally occurs during the summer. Estimated value of UK net landings from the rMCZ: £0.007m/yr.	ground in a single day's fishing.								
	Estimated annual value of UK net landings affected is expected to fall within the following range:								
	£m/yr	Scenario 1	Scenario 2						
	Value of landings affected	0.007	0.007						
<p>UK Hooks and lines: The wider Cape Bank and Bann Shoal area is regularly fished by at least 7–12 day-boat vessels from Hayle and St Ives (Two hand line skippers, pers. comm., 2011). The rMCZ is situated within this fishing ground. In summer 2011, the mackerel catch was relatively poor and this resulted in an increased number (more than 20) of hand liners choosing to target pollack in that fishing ground, including within the rMCZ (Hand line skipper, pers. comm., 2011). The vessels using hooks and lines typically fish more than one gear type.</p> <p>Activity in the rMCZ is limited to when weather conditions are suitable, which is typically during the summer. Hand liners target pollack in the rMCZ and wider Bann Shoal and Cape Bank fishing ground, with cod as occasional bycatch. Regular fishers in the rMCZ also occasionally target mackerel and bass in grounds close inshore (outside the rMCZ) around St Ives and Land's End, while occasional fishers in the rMCZ primarily fish on the mackerel and bass grounds.</p> <p>Estimated value of UK hook and line landings from the rMCZ: £0.005m/yr (MCZ Fisheries Model).</p> <p>The importance of the fishery identified through discussions with fishers and fisheries representatives indicates that this may be an underestimate, as the pollack fishing ground is focussed on the hard ground within the rMCZ (Hand line skippers, pers. comms., 2011). Visual analysis of a regular Bann Shoal and Cape Bank hand line vessel's waypoints – specific places where the vessel fishes – showed a concentration of fishing marks following the hard ground of the Cape Bank and Bann Shoal, inside the rMCZ. It was estimated</p>	<p>Scenarios 1 and 2: Closure of the rMCZ to hooks and lines is expected to have a significant impact on the landings of at least 7–12 regular hand line vessels that fish in the rMCZ RA. The affected vessels may increase effort elsewhere in the fishing ground (as the rMCZ does not cover the whole ground, and/or may be increase increase effort in other fisheries, such as the nearshore mackerel and bass fishery, or increase their effort using other gear types. If these vessels cannot successfully adapt, then the closure will significantly reduce the viability of their businesses (Hand line skipper, pers. comm., 2011).</p> <p>For vessels that occasionally hand line in the rMCZ, the closure will remove an important occasional summer fishery, which allows them to maintain a good level of landings value in years when mackerel catches are poor (such as in 2011).</p> <p>The location of the rMCZ in the middle of the Bann Shoal and Cape Bank fishing ground may increase steaming time and reduce landings for vessels that fish the ground if they need to move their fishing effort between the northern and southern parts of the fishing ground in a single day's fishing. This could occur when catches are not forthcoming at the targeted waypoints, or if other fishers are already active around the targeted waypoints, and would make the fishing ground less viable.</p> <p>The estimated annual value of UK hook and line landings affected is expected to fall within the following range:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.027</td><td>0.027</td></tr></table> <p>If the SAC results in restrictions to fishing with hooks and lines, then this may reduce the potential impact of the rMCZ.</p>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.027	0.027
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.027	0.027							

Table 2a. Commercial fisheries	rMCZ Reference Area Cape Bank
<p>that approximately 25% of the fishers' waypoints fall within the rMCZ and it was acknowledged that they may account for an even higher proportion of landings from the fishing ground (Hand line skipper, pers. comm., 2011).</p> <p>In addition, there is low confidence in the underlying FisherMap data for the Cornish inshore area used in the MCZ Fisheries Model. (This is because the underlying FisheMap data do not distinguish between fishing using pots and traps, nets, and hooks and lines). To address this, an alternative estimate has been provided which reflects the preference for hand liners to target pollack on the rocky habitat of the Bann Shoal and Cape Bank.</p> <p>The alternative estimate is based on the following assumptions:</p> <ul style="list-style-type: none"> (i) The Cape Bank and Bann Shoal fishing ground is thought to account for the vast majority of hand-line-caught pollack from International Council for the Exploration of the Sea (ICES) Rectangle 29E4 (Two hand line skippers, pers. comm., 2011). It is assumed that 80% (an arbitrary figure based on information provided by a hand line skipper (pers. comm., 2011)) of the value of pollack landings from ICES Rectangle 27E4, which averaged £0.095m/yr between 2007 and 2010 (MMO, 2011a), are from the hard ground of the Bann Shoal and Cape Bank. (ii) 25% (based on visual analysis of a single fisher's waypoints described earlier) of vessel landings from the Bann Shoal and Cape Bank fishing ground are from within the rMCZ. (iii) Pollack accounts for 90% of the value of landings by hand liners from the Bann Shoal and Cape Bank fishing ground (based on analysis of landings by a single vessel that works principally in the Bann Shoal and Cape Banks fishing ground [MMO, 2011a]). <p>Alternative estimated value of landings from the rMCZ: £0.027m/yr. This estimate is employed for the analysis to avoid underestimation of costs.</p>	
Total direct impact under Policy Option 1	

Table 2a. Commercial fisheries		rMCZ Reference Area Cape Bank		
Total direct impact on UK commercial fishing	Estimated annual value of UK vessel landings and gross value added (GVA) affected are expected to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	Best estimate
	Value of landings affected	0.058	0.058	0.014
	GVA affected	0.030	0.030	0.008
	The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.			
Impact on non-UK commercial fishing: Non-UK vessels using static gears, bottom trawls/dredges (including 14 French bottom trawlers), and mid-water trawls may fish within the rMCZ (Lee, 2011). Rising fuel costs have resulted in an increase in activity by the French vessels in the wider south-west region (Basse Normandie, pers. comm., 2011). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.000m/yr; static gears: £0.000m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Given that other evidence indicates that French vessels fish within the rMCZ, this may be an underestimate of landings. Estimates are not available for other countries.		Scenario 1: Non-UK vessels using static gears, bottom trawls/dredges, including 14 French bottom trawlers, may be affected by the rMCZ. No further information on the impacts of the rMCZ was received from non-UK fisheries organisations/associations. Estimated value of French vessel landings affected is close to zero. It has not been possible to obtain information on the value of other non-UK vessel landings affected by the rMCZ. 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/associations. It has not been possible to obtain information on the value of non-UK vessel landings affected by the rMCZ.		

Table 2b. Recreation		rMCZ Reference Area Cape Bank
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 under Policy Option 1	

Table 2b. Recreation		rMCZ Reference Area Cape Bank
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 under Policy Option 1	
Angling: There is potentially a low level of angling from private boats but it is unlikely that charter boats visit the rMCZ (Professional Boatman's Association, pers. comm., 2011).	There are unlikely to be any significant impacts on recreational anglers. 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.	

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area Cape Bank
None.	

Contribution to Ecological Network Guidance

This rRA sits within an rMCZ. For information on how this reference area contributes towards the guidelines in the Ecological Network Guidance please see the information provided underneath FS 36 Cape Bank rMCZ. This is also taken from Annex 5 in JNCC and Natural England's Advice on rMCZs.

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 Cape Bank
Baseline	Beneficial impact under Policy Option 1	
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 Reference Area Cape Bank
<p>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, 2012). Crawfish <i>Palinurus elephas</i> is a commercially targeted species. 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.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>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.</p> <p>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.</p> <p>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 crab and crawfish, may improve as a result of reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ.</p> <p>As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.</p> <p>The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision or the off-site impacts of displaced effort.</p>	<p>direction of change:</p> <p>↑</p> <p>Confidence : Low</p>

Table 4b. Recreation		rMCZ Cape Bank Reference Area
Baseline	Beneficial impact under Policy Option 1	
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 Reference Area Cape Bank
Baseline	Beneficial impact under Policy Option 1	

Table 4c. Research and education		rMCZ Reference Area Cape Bank
<p>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.</p> <p>The rMCZ overlaps with a Special Area of Conservation and, as such, ecological monitoring activities are currently ongoing.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is at least 15km offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site.</p> <p>Non-visitors may benefit if the rMCZ contributes to external educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 4d. Regulating services		rMCZ Reference Area Cape Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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).</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 4d. Regulating services		rMCZ Reference Area Cape Bank
<p>Natural hazard protection: As the site is offshore, its features are not thought to contribute to the delivery of this service (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>		

Table 4e. Non-use and option values		rMCZ Reference Area Cape Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p> <p>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 'the undersea plants and animals'.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

rMCZ Celtic Deep**Site area (km²): 347.79**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts				rMCZ Celtic Deep
1a. Ecological description				
<p>The southern tip of the site is approximately 112km to the north-west of Trevoise Head, and the northern tip is approximately 84km from the Pembrokeshire coast in Wales. The depth is largely between 100 metres and 200 metres, constituting a depression on the sea floor in comparison with depths of less than 100 metres in the surrounding area. The sea floor is characterised by subtidal mud habitat, and the Celtic Deep recommended Marine Conservation Zone (rMCZ) is the only offshore area within the Finding Sanctuary Project Area where the ‘mud habitats in deep water’ Feature of Conservation Importance has been recorded. The deep water mud habitat is thought to be influenced by the relatively low levels of tidal stress.</p> <p>At the edge of the Celtic Deep, the communities are typical of a ‘boreal deep mud association’ and include the brittlestars <i>Amphiura chiajei</i> and <i>Amphiura filiformis</i>, the bivalves <i>Nucula sulcata</i>, <i>Nucula tenuis</i>, <i>Thyasira flexuosa</i> and <i>Abra nitida</i>, and polychaetes <i>Myriochele heeri</i>, <i>Lagis</i> (now <i>Pectinaria</i>) <i>koreni</i> and <i>Amphicteis gunneri</i>.</p> <p>The rMCZ intersects with an area where frontal systems occur during the summer months, indicating high productivity. Offshore bird observation data indicate that this is an important aggregation area for a number of sea bird species year-round. The area is also of importance for common dolphins (Lieberknecht and others, 2011).</p>				
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 mud	347.97	-	Unfavourable Condition	Recover to Favourable Condition
Habitats of Conservation Importance				
Mud habitats in deep water	127.25	13	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 Celtic Deep
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Table 2a. Commercial fisheries		rMCZ Celtic Deep		
Source of costs of the rMCZ under Policy Option 1				
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.				
Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.				
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1		
Overview: The rMCZ is close to the south-western edge of the UK’s 200nm (nautical mile) fishery limit and exclusive economic zone. It covers part of a nephrops fishery targeted by UK, Irish, French and Belgian trawlers. There is no evidence of fishing effort with other gear types by UK vessels (MCZ Fisheries Model). In addition, non-UK vessels use static gears.				
Estimated total value of UK vessel landings from the rMCZ: £0.024m/yr.				
UK Bottom trawls: The rMCZ is located in the south-western corner of the most productive nephrops fishery in the south-west marine area (MMO, 2011a; Lee, 2010). Approximately three-quarters of UK vessels active in the area around the rMCZ (the area covered by International Council for the Exploration of the Sea (ICES) Rectangle 30E3) are from Northern Ireland, and range from 10 metres in length to over 30 metres (MMO, 2011a)		Scenario 1: No impacts are anticipated under Scenario 1.		
Estimated value of UK bottom trawl landings from the rMCZ: £0.024m/yr. There is no significant or regular beam trawl activity in the rMCZ.		Scenario 2: Under this scenario, displaced trawlers may respond to the closure to bottom trawling by increasing their effort to the north east of the rMCZ in the remainder of the nephrops fishery overlapped by the rMCZ. The redeployment of effort to remaining grounds risks undermining the fishery’s long-term sustainable yield and may result in increased fishing effort, and therefore costs, in order to catch equivalent levels (National Federation of Fishermen’s Organisations (NFFO), pers. comm., 2012).		
		Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:		
		£m/yr	Scenario 1	Scenario 2
		Value of landings affected	0.000	0.024
Total direct impact				

Table 2a. Commercial fisheries		rMCZ Celtic Deep		
Total direct impact on UK commercial fishing	Estimated annual value of UK vessel landings and gross value added (GVA) affected are expected to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	Best estimate
	Value of landings affected	0.000	0.024	0.003
	GVA affected	0.000	0.010	0.001
	The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.			
Impact on non-UK commercial fishing: Non-UK vessels using static gears, bottom trawls/dredges (in particular Belgian, French and Irish demersal trawlers) and mid-water trawls fish within the rMCZ (Lee, 2010; JNCC, pers. comm., 2012). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.351m/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 bottom trawls/dredges, in particular French and Irish vessels, will be affected by the rMCZ. The estimated value of French landings affected will be: £0.351m/yr (bottom trawls/dredges) and <£0.001m/yr (static gears). No information on the effect on other non-UK vessels is available.		

Table 2b. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ 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). 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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)

rMCZ Celtic Deep

Cables (existing interconnectors and telecom cables), Commercial fisheries: mid-water trawls

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale⁶

✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.

rMCZ Camel Estuary

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
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⁶ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

Mud habitats in deep water	FOCI	✓ * 1	✓	✓	None	Recover		This feature is not protected within existing MPAs.	BAP habitat This feature is not protected within existing MPAs.
A5.3 Subtidal mud	BSH	✓	✓	✓	None	Recover	Out of all of the rMCZs and existing MPAs, this site contributes the second largest area of subtidal mud. This site makes a significant contribution towards achieving the adequacy target for this feature.	Only a small proportion of this BSH is currently protected within existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs. Out of all of the rMCZs and existing MPAs in the Western Channel and Celtic Sea Regional Sea this site contributes the second largest area of subtidal mud.

Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	✓ * 2
Appropriate boundary	✓
Areas of additional ecological importance	✓ * 3

Annex I2. Impact Assessment materials (Finding Sanctuary).

Overlaps with existing MPAs	None
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An overview of features proposed for designation within the Celtic Deep recommended reference area and how these contribute to the ENG guidelines at the regional MCZ project area and at a wider scale copied from JNCC and Natural England's advice on rMCZs

✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Where an asterisk (*) has been given in the table, more detail is provided in the narrative.

ENG Feature	Representativity	Viability	Recommended conservation objective
Mud habitats in deep water	FOCI	✓ * ⁴	Recover to reference condition
Subtidal mud	BSH	X	Recover to reference condition
Site considerations			
Appropriate boundary	✓		

Additional comments and site benefits:

- ¹ The minimum target for replication has not been achieved for the FOCI mud habitats in deep water due to limited known distribution of this habitat FOCI.
- ² Although not put forward for designation, the site area includes Glacial Process erosional features, and some sediment bedforms resulting in topography worthy of further study.
- ³ Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these). This rMCZ and recommended reference area overlap with an area of high benthic species biodiversity and an area of high benthic biotope biodiversity (Langmead, et al. 2010).
- ⁴ The Celtic Deep recommended reference area is very small and only viable for the FOCI mud habitats in deep water, not the broad-scale habitat subtidal mud.

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 5a. Fish and shellfish for human consumption		rMCZ Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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. The mud habitats of the site support commercially targeted fish and shellfish species, of which <i>Nephrops</i> are the primary target (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 unfavourable condition.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>If the conservation objectives of the features are achieved, they 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.</p> <p>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.</p> <p>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.</p> <p>The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision or the off-site impacts of displaced effort.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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 diverse (Fletcher and others, 2012).</p> <p>Natural hazard protection: As the site is offshore, it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives are achieved, the features of the site will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area Celtic Deep**Site area (km²): 1.0**

- This site has been proposed for designation under Policy Option 1.

Table 1. Conservation impacts				rMCZ Reference Area Celtic Deep	
1a. Ecological description					
<p>The depth of the site is 118 metres below chart datum, constituting a depression on the sea floor in comparison with depths of less than 100 metres in the surrounding area. The sea floor is characterised by subtidal mud habitat, and is the only offshore area in the Finding Sanctuary Project Area where the ‘mud habitats in deep water’ Feature of Conservation Importance has been recorded. The deep water mud habitat is thought to be influenced by the relatively low levels of tidal stress.</p> <p>At the edge of the Celtic Deep, the communities are typical of a ‘boreal deep mud association’ and include the brittlestars <i>Amphiura chiajei</i> and <i>Amphiura filiformis</i>, the bivalves <i>Nucula sulcata</i>, <i>Nucula tenuis</i>, <i>Thyasira flexuosa</i> and <i>Abra nitida</i>, and polychaetes <i>Myriochele heeri</i>, <i>Lagis</i> (now <i>Pectinaria</i>) <i>koreni</i> and <i>Amphicteis gunneri</i>.</p> <p>The recommended Marine Conservation Zone (rMCZ) intersects with an area where frontal systems occur during the summer months, indicating high productivity. Offshore bird observation data indicate that this is an important aggregation area for a number of sea bird species year-round. The area is also of importance for common dolphins (Lieberknecht and others, 2011).</p>					
1b. MCZ Feature Baseline and Impact of MCZ					
Feature		Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>					
Subtidal mud		1.0	-	Unfavourable Condition	Recover to Reference Condition
<i>Habitats of Conservation Importance</i>					
Mud habitats in deep water		1.0	6	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 Celtic Deep		
Source of costs of the rMCZ under Policy Option 1				
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: Closure of rMCZ to all commercial fishing, except mid-water trawls.				
Management scenario 2: Closure of rMCZ to all commercial fishing.				
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1		
Overview: The rMCZ is close to the south-western edge of the UK's 200nm (nautical mile) fishery limit and exclusive economic zone. The rMCZ covers part of a nephrops fishery targeted by UK, Irish, French and Belgian trawlers. There is no evidence of any fishing effort with other gear types (MCZ Fisheries Model). The rMCZ is small, covering just 1km ² .				
Estimated total value of UK vessel landings from the rMCZ: <£0.001m/yr.				
UK Bottom trawls: The rMCZ is located in the south-western corner of the most productive nephrops fishery in the south-west marine area (MMO, 2011a; Lee, 2010). Approximately three-quarters of UK vessels active in the area around the rMCZ (the area covered by International Council for the Exploration of the Sea (ICES) Rectangle 30E3) are from Northern Ireland, with vessel sizes ranging from 10 metres in length to over 30 metres (MMO, 2011a). The rMCZ is small, covering just 1km ² , and landings from the area are low.		Scenarios 1 and 2: The value of landings affected by the rMCZ is small, at <£0.001m/yr. No significant impacts are therefore expected as a result of the designation.		
Estimated value of UK bottom trawl landings from the rMCZ RA: <£0.001m/yr.		Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:		
		£m/yr	Scenario 1	Scenario 2
		Value of landings affected	<0.001	<0.001

Table 2a. Commercial fisheries		rMCZ Reference Area Celtic Deep		
Total direct impact under Policy Option 1				
Total direct impact on UK commercial fishing	Estimated annual value of UK vessel landings and gross value added (GVA) affected are expected to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	Best estimate
	Value of landings affected	<0.001	<0.001	<0.0001
	GVA affected	<0.001	<0.001	<0.0001
	The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for the site.			
Impact on non-UK commercial fishing: Non-UK vessels using static gears, bottom trawls/dredges (in particular Belgian, French and Irish demersal trawlers) and mid-water trawls fish within the rMCZ RA (Lee, 2010; JNCC, pers. comm., 2012). Estimated value of landings from the rMCZ by French vessels (all gears): £0.000m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries		Scenarios 1 and 2: Non-UK vessels using bottom trawls/dredges, in particular French and Irish vessels, will be affected by the rMCZ, although the value of landings by French vessels from the rMCZ is estimated to be zero. No further information on the impacts of the rMCZ was received from non-UK fisheries organisations/associations. It has not been possible to obtain information on the value of other non-UK vessel landings affected by the rMCZ.		

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area Celtic Deep
None.	

Contribution to Ecological Network Guidance

This rRA sits within an rMCZ. For information on how this reference area contributes towards the guidelines in the Ecological Network Guidance please see the information provided underneath FS 10 Celtic Deep rMCZ. This is also taken from Annex 5 in JNCC and Natural England's Advice on rMCZs.

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 5a. Fish and shellfish for human consumption		rMCZ Reference Area Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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. The mud habitats of the site support commercially targeted fish and shellfish species, of which <i>Nephrops</i> are the primary target (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 unfavourable condition.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>If the conservation objectives of the features are achieved, they will be recovered to favourable 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 2a.</p> <p>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. However, 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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Reference Area Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ Reference Area Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities currently occur in the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>Non-visitors may benefit if the rMCZ contributes the wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ Reference Area Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5d. Regulating services		rMCZ Reference Area Celtic Deep
<p>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 diverse (Fletcher and others, 2012).</p> <p>Natural hazard protection: As the site is offshore, its features are not thought to contribute to the delivery of this service (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	habitats.	Confidence: Low

Table 5e. Non-use and option values		rMCZ Reference Area Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
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 the option to benefit from the services in the future from the risk of future degradation.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Dart Estuary**Site area (km²): 4.7**

- This site has been proposed for designation under Policy Option 1 only.
- Based on SNCB advice, the draft conservation objective for a feature in this site has been changed from those established by the Regional Projects. The impacts of this change on management and costs have not been reflected in this Impact Assessment.

Table 1. Conservation impacts				rMCZ Dart Estuary
1a. Ecological description				
<p>The site encompasses part of the upper Dart Estuary. The Dart Estuary is a ria, with steep rocky shores near the mouth of the estuary, and stretches of meandering mudflats further upstream. The upper estuary is surrounded mainly by farmland, with small patches of woodland.</p> <p>Littoral and sublittoral habitats in the middle and upper estuary are predominantly mud, with occasional rock outcrops. Mudflats within the estuary have been reported as having low species richness but high biomass. Ragworm <i>Hediste diversicolor</i> is abundant throughout the estuary; all the infaunal communities are dominated by polychaete worms. Sublittoral habitats are predominantly composed of muddy pebbles and cobbles with sponges, hydroids and anemones characterising the communities recorded. Dredge samples of muddy sediments have produced large numbers of polychaete worms. The Seahorse Trust has received a large number of seahorse sightings (both species) from the Dart Estuary, as far upstream as Dittisham (within the recommended Marine Conservation Zone boundary) (Lieberknecht and others, 2011).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Intertidal mud	1.90	-	Favourable Condition	Maintained at Favourable Condition
Low energy intertidal rock	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mud	2.28	-	Favourable Condition	Maintained at Favourable Condition
Coastal saltmarsh and saline reedbeds	0.02	-	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
Estuarine rocky habitats	-	5	Favourable Condition	Maintained at Favourable Condition
Intertidal under boulder communities	-	1	Favourable Condition	Maintained at Favourable Condition

Species of Conservation Importance				
<i>Alkmarmia romijni</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Anguilla anguilla</i>	-	-	To be determined	To be determined
SNCBs advise that the conservation objective for the European eel (<i>Anguilla anguilla</i>) is designated as “Recover to Favourable Condition”.				

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

Table 2a. Aquaculture		rMCZ Dart Estuary
<p>Source of costs of the rMCZ under Policy Option 1 Management scenario 1: No additional management.</p> <p>Management scenario 2: Compulsory use of triploid stock for Pacific oyster cultivation.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
<p>There are 6 aquaculture businesses in the Dart Estuary. The businesses operate under the Waddeton Fishery Order 2001 via the Devon and Severn Inshore Fisheries and Conservation Authorities (IFCA) Regulating Order and also a licence issued by the Duchy of Cornwall (Devon and Senvern IFCA, pers. comm., 2011).</p> <p>There is mixed shellfish cultivation within the estuary which includes mussel, cockle, clam and Pacific oyster; 5 of the 6 businesses cultivate Pacific oyster, providing the majority of the output for the estuary (Dart Estuary aquaculture operators, pers. comm., 2011).</p> <p>All of the current Pacific oyster cultivation is carried out using diploid stock. Some businesses have considered using triploid stock but have been unable to source it due to a lack of supply in the UK (Aquaculture operators, pers. comm., 2011). Discussions with UK seed stock producers verify that there is a shortage of supply, with no immediate opportunity to increase it (Seasalter (Walney) Limited, pers. comm., 2011 and Seasalter Shellfish (Whitstable)</p>	<p>Scenario 1: No costs are anticipated as a result of this scenario.</p> <p>Scenario 2: It is unlikely that the operators in the Dart would be able to source sufficient volumes of triploid seed stock to allow them to continue cultivating Pacific oysters at the current level. As such it is expected that the operators would cease to produce Pacific oyster as a result of the management scenario that requires compulsory use of triploid stock.</p> <p>While one operator has successfully cultivated Pacific oyster using triploid stock in the past, there is concern among the other operators that triploid stock may not grow as successfully in the Dart as diploid stock, as indicated by the growth trial conducted by the Devon and Severn IFCA (then known as Devon Sea Fisheries Committee) in 2009. If cultivation using triploid stock could not be successfully carried out, even if suitable supply of triploid stock could be secured, cultivation of Pacific oyster may not be viable.</p> <p>Scenario 2 for the rMCZ may therefore result in a cessation of Pacific oyster cultivation either due to a lack of supply or to poor cultivation success, or a combination of both (Dart Estuary aquaculture operators, pers. comm., 2011). Given that Pacific oyster cultivation</p>	

Table 2a. Aquaculture	rMCZ Dart Estuary
<p>Limited, pers. comm., 2011). Supply from outside of the UK is not possible due to the presence of the herpes virus in these stocks (there is an agreement in place between operators on the Dart to keep the estuary virus free).</p> <p>One business has used triploid stock for Pacific oyster cultivation in the past, but is not currently actively farming shellfish within the estuary (Dart Estuary aquaculture operator, pers. comm., 2011). A growth trial was conducted by the Devon and Severn IFCA in 5 Devon estuaries in 2009 to compare different methods of growing Pacific oysters, including the use of triploids. It was noted that the growth of triploid Pacific oysters was much faster than diploid Pacific oysters in all the estuaries but, as a result, triploids needed much more husbandry and management. In September 2009, oyster mortality was recorded on the Dart. Higher mortality rates were recorded for triploid oyster than diploid: the mortality rate was between 23% and 42% for the triploid stock compared to a maximum mortality in diploids of 20% (Devon and Severn IFCA, 2011).</p>	<p>accounts for the majority of the value of output from the aquaculture industry on the Dart, the loss of output would reduce the viability of the businesses present. The aquaculture operators stated that they would potentially be put out of business as a result of the compulsory use of triploid stock due to the problems in securing stock and higher mortality rates. If the operators went out of business then this may result in the loss of the entire fishery. Whilst it may theoretically be possible for the businesses affected to increase cultivation of other species, such as mussels, clams or cockles, to off-set the losses from Pacific oysters, this was not identified as an option by the interviewed businesses.</p> <p>An estimate of the cost is not provided at the level of the rMCZ because this information is commercially sensitive and there are only a small number of businesses present. See Annex N for an estimate of the rMCZs in the Finding Sanctuary project area and the national suite of rMCZs.</p>

Table 2b. Archaeological heritage	rMCZ Dart Estuary
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>Four wrecks are recorded in the site, including the remains of a hulked English houseboat. A D-Day landing craft maintenance site is also recorded on the River Dart, although it is not clear if this is inside the rMCZ (English Heritage, pers. comm., 2012).</p>	<p>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</p>

Table 2b. Archaeological heritage	rMCZ Dart Estuary
	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 2c. Ports, harbours, shipping and disposal sites		rMCZ Dart Estuary	
Source of costs of the rMCZ under Policy Option 1			
Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications with 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 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 under Policy Option 1	
<u>Harbour development:</u> Dart Harbour, Britannia Royal Naval College and Dart Marina are all between 1km and 5km from the rMCZ. There are no known plans for developments.	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.000	<0.001*
	*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.		
Scenario 1: No costs are anticipated under scenario 1.			
Scenario 2: Under 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			

Table 2c. Ports, harbours, shipping and disposal sites	rMCZ Dart Estuary
	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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Dart Estuary
Recreation; research and education; water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale⁷</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>	rMCZ Dart Estuary
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⁷ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex 12. Impact Assessment materials (Finding Sanctuary).

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A1.3 Low energy intertidal rock	BSH	✓	✓	✓	None	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the second largest area of intertidal mud		
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	N/A	✓	None	Maintain			
A5.3 Subtidal mud	BSH	✓	✓	✓	None	Maintain			
Intertidal underboulder communities	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Estuarine rocky habitats	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat

Annex I2. Impact Assessment materials (Finding Sanctuary).

Tentacled lagoon-worm <i>Alkmaria romijni</i>	FOCI Species	✓	✓	✓	None	Maintain	This FOCI is currently only reaching the minimum replication target		WCA species
European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	✓	N/A	None	Maintain/ Recover * 5			BAP and OSPAR species
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * 1					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

¹ There have been a large number of seahorse sightings within the rMCZ boundary, reported to the Seahorse Trust (SAD in (Lieberknecht, et al. 2011)). The Dart is an important estuary for migratory anadromous fish (for example, salmon, sea trout, eels), and other habitats present include small saline lagoons, sheltered muddy gravels, and salt marsh. The native oyster, *Ostrea edulis*, has been recorded within the rMCZ boundary.

Infaunal species on the Dart are very diverse with a number of notably rare and scarce species (for example, *Cerebratulus pantherinus*, *Sternaspis scutata*, *Jaxea nocturna*, and *Selioides bocqueti*). (pers comm, G. Black, Natural England)

Anticipated benefits to ecosystem services

Annex I2. Impact Assessment materials (Finding Sanctuary).

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 5a. Fish and shellfish for human consumption		rMCZ Dart Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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.</p> <p>However, there is currently no commercial fishing within the rMCZ and therefore no value derived from on-site fisheries. It has not been possible to estimate the value derived from off-site fisheries as a result of the nursery area function.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence : Moderate</p>

Table 5b. Recreation		rMCZ Dart Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 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.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence:</p>

Table 5b. Recreation		rMCZ Dart Estuary
<p>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.</p> <p>Fishing takes place at a number of marks around the estuary, including shore angling and angling from boats. It has not been possible to estimate the value of angling in the site.</p>	<p>pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).</p> <p>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.</p>	Moderate
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
<p>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.</p> <p>The Dart Estuary supports a wide variety of wildlife. Grey seals, otters and occasionally dolphins can be seen in the rMCZ. Visitors can watch seals collect on the Mew Stone which is a short distance outside of the mouth of the estuary. The Dart supports a large number of bird species: herons, little egrets, cormorants and kingfishers can all be seen within the estuary. In addition, visitors walking along the estuary can see redshanks, greenshanks, dunlins and oystercatchers, mute swans and shelducks. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education	rMCZ Dart Estuary
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Table 5c. Research and education		rMCZ Dart Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>Research activities are carried out under the Dart Estuary Management Plan, including baseline surveys of critical habitats and individual species (South Devon AONB, 2006). The full extent of current research activity carried out in the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Interpretation and education of the estuary environment is provided for through the Dart Estuary Management Plan. This includes links with local schools and colleges and public events (South Devon AONB, 2006). The estuary receives high numbers of visitors. It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	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).	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Dart Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 <i>Spartina anglica</i> which grows in intertidal mud (Fletcher and others, 2011; 2012).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rocky habitats in estuaries</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence:</p>

Table 5d. Regulating services		rMCZ Dart Estuary
<p>make a significant contribution to the overall diversity (Fletcher and others, 2012).</p> <p>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).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	necessary, mitigation would be introduced, with the associated costs and benefits).	Moderate

Table 5e. Non-use and option values		rMCZ Dart Estuary
Baseline	Beneficial impact under Policy Option 1	
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 the option to benefit from the services in the future from the risk of future degradation.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Devon Avon Estuary**Site area (km²): 1.84**

- This site has been proposed for designation under Policy Option 1 only.
- Based on SNCB advice, the draft conservation objective for a feature in this site has been changed from what was established by the Regional Projects. The impacts of these changes on management and costs are not reflected in this Impact Assessment.

Table 1. Conservation impacts				rMCZ Devon Avon Estuary
1a. Ecological description				
<p>The recommended Marine Conservation Zone encompasses the whole Devon Avon Estuary up to the mean high water mark, as far as Aveton Gifford. The estuary is small (approximately 4km long), consisting predominantly of a sand bottom. It has steep-sided margins, cut into relatively weak Devonian slates and grits, and is generally considered a ria-type (drowned river) estuary. The estuary has since been in-filled by an accumulation of sediment so that, at low water, the channels are narrow and shallow. The estuary has conservation importance due to high productivity and its ecological function as a nursery area.</p> <p>The five main depositional environments in the estuary include beach and dune deposits at Bantham and Cockleridge; an extensive ebb-tidal delta forming part of the tombolo behind Burgh Island; a flood-tidal delta with several intertidal shoals in the outer estuary; a main tidal channel that meanders along the entire estuary, with a tidal weir at Aveton Gifford; and saltmarshes in the upper estuary.</p> <p>The estuary has been described as having a coarse, scoured channel at the mouth and the head of the estuary; predominantly coarse and fine sand in the lower estuary; and a mixture of fine sand (channel and intertidal shoals) and silt (saltmarsh and tidal flat) in the upper estuary. The mouth of the estuary has semi-exposed rock platforms with rich rock pool, underboulder and overhang communities on the low shore.</p> <p>The saltmarsh sediments in the Devon Avon are up to about 1 metre thick and are underlain by intertidal sand. The saltmarshes are largely limited to pioneer vegetation, with a narrower band of low to mid marsh species and small areas of mid-upper marsh species. Upper saltmarsh vegetation is not found within the key saltmarsh areas adjacent to the main river channel, but may be found along some of the tributaries that flow into the channel. The marshes are likely to be vulnerable to future sea level rise and coastal squeeze due to the constraints placed upon them by the valley sides (Lieberknecht and others, 2011).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Coastal saltmarsh and saline reedbeds	0.07	-	Favourable Condition	Maintained at Favourable Condition
High energy infralittoral rock	0.24	-	Favourable Condition	Maintained at Favourable Condition

Annex I2. Impact Assessment materials (Finding Sanctuary).

Intertidal coarse sediment	0.01	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	1.12	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.10	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.04	-	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
<i>Species of Conservation Importance</i>				
<i>Alkmaria romijni</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Anguilla anguilla</i>	-	-	To be determined	To be determined
SNCBs advice that the conservation objective for the European eel (<i>Anguilla anguilla</i>) is set to “Recover to Favourable Condition”.				

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

Table 2a. Aquaculture		rMCZ Devon Avon Estuary
Source of costs of the rMCZ under Policy Option 1 Management scenario 1: No additional management. Management scenario 2: Compulsory use of triploid stock for Pacific oyster cultivation.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
<p>There is one aquaculture business in the Devon Avon Estuary. Pacific oyster are the only species farmed in the estuary. The land is leased from the landowner (the Duchy of Cornwall) to Evans Estates, which leases the fishing rights to the sole operator.</p> <p>At present, 10% of the seed stock used in the estuary is triploid seed, which seems to grow well. The use of triploid stock is limited to 10% because larger</p>	<p>Scenario 1: No costs are anticipated as a result of this scenario.</p> <p>Scenario 2: It is unlikely that the operator in the Devon Avon Estuary would be able to source sufficient volumes of triploid seed stock to allow it to continue cultivating Pacific oyster at the current level. As such, it would be expected to lose 90% of its Pacific oyster output (the remaining 10% is farmed using triploid stock). The compulsory use of triploid stock is therefore likely to significantly reduce the income of the business and may result in</p>	

Table 2a. Aquaculture	rMCZ Devon Avon Estuary
<p>amounts cannot be sourced from within the UK (Bigbury Bay Oysters, pers. comm., 2011). Discussions with UK seed stock producers verify that there is a shortage of supply, with no immediate opportunity to increase it (Seasalter (Walney) Limited, pers. comm., 2011 and Seasalter Shellfish (Whitstable) Limited, pers. comm., 2011). Supply from outside of the UK is not possible due to the presence of the herpes virus in these stocks.</p>	<p>it becoming unviable.</p> <p>The current use of triploid stock (10% of total seed stock) in the estuary indicates that if sufficient additional supply could be attained then the operator could successfully continue its current operations under this management scenario with relatively limited change in underlying costs. This it is unlikely that sufficient stocks would be available from the UK.</p> <p>An estimate of the cost is not provided at the level of rMCZ because this information is commercially sensitive as there is only one business present. See Annex N for an estimate of the south-west suite of rMCZs and national suite of rMCZs.</p>

Table 2b. Archaeological heritage	rMCZ Devon Avon Estuary
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>A World War II Type 24 pillbox is situated on the west side of Sedgewell Cove. It is not known if this is located in the site or nearby (English Heritage, pers. comm., 2012).</p>	<p>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.</p>

Table 2c. Flood and coastal erosion risk management (coastal defence)	rMCZ Devon Avon Estuary
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Table 2c. Flood and coastal erosion risk management (coastal defence)		rMCZ Devon Avon Estuary
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
The 0 to 20 year Shoreline Management Plan policies along the landward edges of the rMCZ are predominantly 'managed realignment' along the inner estuary and 'no active intervention' at the outer estuary. The Aveton Gifford Habitat Scheme is anticipated within the next 5 years (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. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Devon Avon Estuary
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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Devon Avon Estuary
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Cables (existing interconnectors and telecom cables); recreation; research and education; water abstraction, discharge and diffuse pollution*.

* The IA assumes 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).

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale⁸

✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.

rMCZ Devon Avon Estuary

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓ * ¹	None	Maintain			
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓ * ¹	None	Maintain			

⁸ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓ * 1	None	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	✓ * 1	None	Maintain			
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	N/A	✓ * 1	None	Maintain			
A3.1 High energy infralittoral rock	BSH	✓	✓	✓ * 1	None	Maintain			
A5.2 Subtidal sand	BSH	✓	✓	✓ * 1	None	Maintain		Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
A5.3 Subtidal mud	BSH	✓	✓	✓ * 1	None	Maintain			
Tentacled lagoon-worm <i>Alkmaria romijni</i>	FOCI Species	✓	✓	✓ * 2	None	Maintain	This FOCI is currently only reaching the minimum replication target		WCA species

Annex I2. Impact Assessment materials (Finding Sanctuary).

European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	✓	N/A	None	Maintain Recover * 5 /			BAP and OSPAR
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Additional comments and site benefits:

¹ Although this rMCZ does not meet the minimum viable size for BSHs (5km minimum diameter), the entire estuary unit is contained within the rMCZ boundary. Therefore this rMCZ is believed to be viable for all BSHs (using Natural England expert judgement).

² Although the minimum viable patch diameter for *Alkmaria romijni* (0.5km) is not met around the record of this feature, it is still considered viable, as the narrow shape of estuaries means that the patch size viability is met through the maximum diameter only.

³ This estuary is potentially very important for seahorse populations, as it provides food and shelter (SAD in (Lieberknecht, et al. 2011)).

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 5a. Fish and shellfish for human consumption		rMCZ Devon Avon Estuary
Baseline	Beneficial impact under Policy Option 1	
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. 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.	<p>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.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence : Moderate</p>

Table 5a. Fish and shellfish for human consumption	rMCZ Devon Avon Estuary	
However, there is currently no commercial fishing within the rMCZ and therefore no value derived from on-site fisheries. It has not been possible to estimate the value derived from off-site fisheries as a result of the nursery area function.	by human activities (because, if necessary, mitigation would be introduced, with the associated costs and benefits).	

Table 5b. Recreation	rMCZ Devon Avon Estuary	
Baseline	Beneficial impact under Policy Option 1	
<p>Angling: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of fish and shellfish for human consumption and recreation services. 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.</p> <p>Shore angling and angling from boats occurs in the estuary, targeting species including bass and sea trout. It has not been possible to estimate the value of angling in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Moderate</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	N/A	N/A
<p>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.</p> <p>There are several walks along the Devon Avon Estuary where visitors can enjoy the local wildlife. The estuary attracts waders including curlews, lapwings, redshanks and greenshanks and common sandpipers. Little grebes,</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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,</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation	rMCZ Devon Avon Estuary	
<p>black-headed gulls, herring gulls, common gulls, herons and little egrets are often spotted and shelducks breed in the area. In the winter, mute swans gather at the estuary which is known as one of the best places in Devon to spot swans. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>with the associated costs and benefits).</p> <p>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.</p>	

Table 5c. Research and education	rMCZ Devon Avon Estuary	
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>Research activities are carried out under the Avon Estuary Forum and Avon Estuary Management Plan, including research related to catchment sensitive farming (Avon Estuary Forum, 2009). The John Crawford Environmental Award scheme provides funding for projects of relevance to the river. The first award (in 2008) contributed to the funding of a project studying the possible effects of oestrogen mimics (widespread water pollutants) on a particular species of clam (Watts, 2008). The full extent of current research activity carried out in the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The Aune Conservation Association (ACA) organises environmental management activities, walks and public lectures (ACA Forum, 2012); while the Avon Estuary Management Plan has objectives to establish a school visits programme and a series of summer lectures walks and events over the period 2011 to 2016 (Avon Estuary Forum, 2009). It has not been possible to</p>	<p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ Devon Avon Estuary
estimate the value derived from education activities associated with the rMCZ.		

Table 5d. Regulating services		rMCZ Devon Avon Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 <i>Spartina anglica</i> which grows in intertidal mud (Fletcher and others, 2011).</p> <p>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).</p> <p>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).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ Devon Avon Estuary
Baseline	Beneficial impact under Policy Option 1	

Table 5e. Non-use and option values	rMCZ Devon Avon Estuary
<p>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.</p>	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p> <p>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 the area because they felt it was under threat, and because they had a personal affinity with the site and thought the 'whole place is amazing'.</p>
	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

rMCZ East of Celtic Deep**Site area (km²): 94.9**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts				rMCZ East of Celtic Deep
1a. Ecological description				
<p>The site is approximately 40km south of the Pembrokeshire coast in Wales. The depth is within the 50–100 metre range, with the western edge dipping below the 100 metre depth contour. The sea bed is characterised by subtidal sand, with a patch of mud.</p> <p>The site has added ecological importance as it is in an area where frontal systems occur during the summer months, indicating high productivity. Offshore bird observation data indicate that this is an important aggregation area for a number of sea bird species year-round; and is of particular importance for wintering birds (Lieberknecht and others, 2011).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Subtidal sand	84.01	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mud	10.18	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal coarse sediment	0.71	-	Unfavourable Ccondition	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 East of Celtic Deep
Source of costs of the rMCZ under Policy Option 1	
<p>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</p>	

Table 2a. Commercial fisheries		rMCZ East of Celtic Deep													
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 under Policy Option 1													
Overview: The rMCZ is situated outside the 12nm (nautical mile) limit, on the median line between English and Welsh waters. The rMCZ is located on the eastern edge of a nephrops fishery targeted by UK, Irish, French and Belgian trawlers. There is no evidence of fishing effort with other gear types by UK vessels (MCZ Fisheries Model). In addition, non-UK vessels use static gears. Estimated total value of UK vessel landings from the rMCZ is £0.002m/yr.															
UK Bottom trawls: The rMCZ is located on the eastern edge of the most productive nephrops fishery in the south-west marine area, although the level of fishing effort inside the rMCZ is relatively low (MCZ Fisheries Model). Activity is dominated by Northern Irish nephrops trawlers. Estimated value of UK bottom trawl landings from the rMCZ is £0.002m/yr.	Scenario 1: No impacts are anticipated under Scenario 1.														
	Scenario 2: The value of landings affected by the rMCZ is small, at £0.002m/yr. No significant impacts are therefore expected as a result of the designation 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>0.002</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.002						
£m/yr	Scenario 1	Scenario 2													
Value of landings affected	0.000	0.002													
Total direct impact under Policy Option 1															
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:														
	<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.002</td><td><0.001</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.001</td><td><0.001</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Best estimate	Value of landings affected	0.000	0.002	<0.001	GVA affected	0.000	0.001	<0.001
	£m/yr	Scenario 1	Scenario 2	Best estimate											
	Value of landings affected	0.000	0.002	<0.001											
GVA affected	0.000	0.001	<0.001												
The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas.															

Table 2a. Commercial fisheries	rMCZ East of Celtic Deep
	This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.
<p>Impact on non-UK commercial fisheries: Non-UK vessels using static gears, bottom trawls/dredges (in particular Belgian, French and Irish demersal trawlers) and mid-water trawls fish within the rMCZ (Lee, 2010). Estimated value of landings from the rMCZ by French vessels – bottom trawls/dredges: £0.066m/yr; static gears: £0.005m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>Scenario 2: Non-UK vessels using bottom trawls/dredges, in particular French vessels, will be affected by the rMCZ.</p> <p>The estimated value of French landings affected: £0.066m/yr (bottom trawls/dredges). No information on the effect on other non-UK vessels is available.</p>

Table 2b. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ East of Celtic Deep
<p>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).</p>	

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ East of Celtic Deep
Cables (existing interconnectors and telecom cables), commercial fisheries (mid-water trawl)	

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ⁹ ✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.								rMCZ East of Celtic Deep	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.1 Subtidal coarse sediment	BSH								
A5.2 Subtidal sand	BSH	□	□	□	None	Recover		Only a small proportion of this feature is captured in existing MPAs.	
A5.3 Subtidal mud	BSH	□	□	□	None	Recover		Only a small proportion of this BSH is	Only a small proportion of this BSH is

⁹ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

								currently protected within existing MPAs	currently protected within existing MPAs in the Western Channel and Celtic Sea Regional Sea
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				✓ * ¹					
Appropriate boundary				✓					
Areas of additional ecological importance				✓ * ²					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

- ¹ Although this rMCZ is not proposed directly for its geological or geomorphological features of interest, there are features such as the Celtic Deep glaciated channel and the area shows the maximum lateral extent of ice during the last glacial period. A recent survey also found large sand waves (possibly relict) within this rMCZ.
- ² The regional MCZ project recommendations state that this rMCZ was selected in part because of its added ecological importance (Lieberknecht, et al. 2011) (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these). This site overlaps with an area of high benthic species biodiversity (Langmead, et al. 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 5a. Fish and shellfish for human consumption		rMCZ East of Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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 can 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 unfavourable condition.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. Additional management of commercial fishing is expected, the costs of which are set out in Table 2a.</p> <p>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, the current level of fishing effort is very low, so a minimal reduction in fish and shellfish harvesting is anticipated.</p> <p>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 fish.</p> <p>Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.</p> <p>The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision or the off-site impacts of displaced effort.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ East of Celtic Deep
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Table 5b. Recreation		rMCZ East of Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ East of Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services	rMCZ East of Celtic Deep
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Table 5d. Regulating services		rMCZ East of Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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).</p> <p>Natural hazard protection: As the site is offshore, it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives are achieved, the features of the site will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ East of Celtic Deep
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ East of Jones Bank**Site area (km²): 359.38**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts				rMCZ East of Jones Bank
1a. Ecological description				
The eastern site boundary is approximately 126km to the west of Land's End. The site is at a depth of between 100 metres and 200 metres, and is largely characterised by moderate energy circalittoral rock. There is anecdotal evidence that this area is characterised not by solid bedrock but by loose cobbles (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
<i>Broad-scale Habitats</i>				
Moderate energy circalittoral rock	342.75	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mud	14.44	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	2.19	-	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 East of Jones Bank
Source of costs of the rMCZ under Policy Option 1	
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 2a. Commercial fisheries		rMCZ East of Jones Bank				
Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.						
Management scenario 3: Zoned closure of moderate energy circalittoral rock in the rMCZ to bottom trawls, dredges, 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 under Policy Option 1				
Overview: The rMCZ is situated midway between the UK 12nm (nautical mile) limit and the UK's 200nm fishery limit. Fishing in the rMCZ is dominated by French otter trawlers. There is a low level of UK beam trawling and gill netting in the rMCZ (MCZ Fisheries Model). Netters are active throughout the rMCZ. Estimated total value of UK vessel landings from the rMCZ: £0.013m/yr.						
UK Bottom trawls: UK trawlers active in the wider area (defined as the International Council for the Exploration of the Sea (ICES) Rectangles 28E2 and 29E2) are typically beam trawlers of between 20 and 35 metres in length. Fishing effort in the rMCZ is low (MCZ Fisheries Model). Estimated value of UK bottom trawl landings from the rMCZ: £0.06m/yr.		Scenario 1: No impacts are anticipated under Scenario 1.				
		Scenarios 2, 3 and 4: The rMCZ does not cover a known trawling ground (South West Fishing Industry Group, 2011) and landings from it are low. As such no significant impacts are anticipated under these scenarios. The area of zoned management (scenario 3) covers the majority of the rMCZ and the impacts are therefore assumed to be the same as for full rMCZ closure (scenarios 2 and 4). 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	0.006	0.006	0.006
UK Nets: A description of the baseline is not available for this rMCZ. Estimated value of UK net landings from the rMCZ: £0.007m/yr.		Scenarios 1 and 2: No impacts are anticipated under these scenarios.				
		Scenarios 3 and 4: A relatively low value of landings will be affected under these scenarios. No further information on the 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	0.000	0.000	0.007	0.007

Table 2a. Commercial fisheries		rMCZ East of Jones Bank																							
		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 under Policy Option 1																									
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:																							
		<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.006</td><td>0.013</td><td>0.013</td><td>0.001</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.003</td><td>0.006</td><td>0.006</td><td>0.001</td></tr></table>						£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate	Value of landings affected	0.000	0.006	0.013	0.013	0.001	GVA affected	0.000	0.003	0.006	0.006	0.001
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate																				
Value of landings affected	0.000	0.006	0.013	0.013	0.001																				
GVA affected	0.000	0.003	0.006	0.006	0.001																				
		The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.																							
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). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.175m/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. Scenarios 2, 3 and 4: Non-UK vessels using static gears and bottom trawls/dredges, in particular French otter trawlers, would be affected by the rMCZ. In the event of a full closure of the rMCZ the estimated value of French landings affected would be: £0.175m/yr (bottom trawls/dredges) and <£0.001 (static gears). No information on the effect on the value of landings of other countries' vessels is available. The area of zoned management covers the majority of the rMCZ and the impacts are therefore likely to be similar as for full rMCZ closure.																							

Table 2b. National defence		rMCZ East of Jones Bank
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
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 under Policy Option 1 and not for this site alone	rMCZ East 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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ East of Jones Bank
Cables (existing interconnectors and telecom cables), commercial fishing (mid-water trawl)	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale¹⁰</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>								rMCZ East of Jones Bank	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A4.2 Moderate energy circalittoral rock	BSH	□	□ * 1	□	None	Recover	This BSH is currently only reaching the minimum adequacy target. This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project area		
A5.2 Subtidal sand	BSH								

¹⁰ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

A5.3 Subtidal mud	BSH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> * 3	None	Recover		Only a small proportion of this BSH is currently protected within existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea Regional Sea.
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Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	✓ * 3
Appropriate boundary	✓
Areas of additional ecological importance	✓ * 4
Overlaps with existing MPAs	None

Additional comments and site benefits:

- ¹ The adequacy target for moderate energy circalittoral rock feature has only just been achieved within this regional MCZ project area.
- ² Although the site is viable in size, subtidal mud only occurs in a very small patch.
- ³ Although this rMCZ is not proposed directly for its geological or geomorphological features of interest, the area encompasses the maximum lateral extent of ice during the last glacial period.

- ⁴ Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these).

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 5a. Fish and shellfish for human consumption		rMCZ East of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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 sand and coarse sediment habitats (the two dominant habitats in the rMCZ) 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 unfavourable condition.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>If the conservation objectives of the features are achieved, they 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.</p> <p>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.</p> <p>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.</p> <p>The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision or the off-site impacts of displaced effort.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ East of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ East of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	Monitoring of the rMCZ will help inform understanding of how the marine environment is changing and is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ East of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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).</p> <p>Natural hazard protection: As the site is offshore, it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ East of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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 the option to benefit from the services in the future from the risk of future degradation.</p> <p>Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society's 'Your Seas Your Voice' campaign</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ East of Jones Bank
	expressed a desire to protect the area, with the most common reasons being because of the 'spectacular scenery', because 'the whole place is amazing' and because 'it means a great deal to me personally'.	

rMCZ Erme Estuary**Site area (km²): 1.32**

- This site has been proposed for designation under Policy Option 1 only.
- Based on SNCB advice, the draft conservation objective for one feature has been changed from those established by the Regional Projects. The impacts of this change on management and costs are not reflected in this Impact Assessment.

Table 1. Conservation impacts				rMCZ Erme Estuary
1a. Ecological description				
<p>The recommended Marine Conservation Zone encompasses the whole of the Erme Estuary up to the mean high water mark, as far as the weir just south of Sequer’s Bridge. The Erme is a narrow, sheltered estuary approximately 6.5km long. It is very secluded, has steep wooded banks and is a notified Site of Special Scientific Interest for its woodland. It lies within an Area of Outstanding Natural Beauty, and within the South Devon Heritage Coast.</p> <p>The habitats are predominantly sedimentary with some broken sand-scoured bedrock at the mouth. Mobile sediments near the channel have a typical crustacean–polychaete community characterised by the amphipods <i>Bathyporeia pilosa</i> and <i>Eurydice pulchra</i>. More sheltered sediment infaunal communities are characterised by the ragworm <i>Hediste diversicolor</i>. Low shore shingle and cobble habitats are colonised by the brackish water algae <i>Fucus ceranoides</i>. The estuary is a spawning ground for sea trout and has a population of the European otter.</p> <p>European eel <i>Anguilla anguilla</i> has been reported in the estuary. Sampling of four major taxonomic groups has been carried out in the estuary: oligochaetes; amphipod crustaceans (mainly <i>Gammarus</i> spp.); the ragworm <i>Nereis diversicolor</i>, and either mysids (mainly <i>Neomysis integer</i>) or the brown shrimp <i>Crangon crangon</i> (Lieberknecht and others, 2011).</p>				
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	0.14	-	Favourable Condition	Maintained at Favourable Condition

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High energy intertidal rock	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	0.02	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.01	-	Favourable Condition	Maintained at Favourable Condition
Low energy infralittoral rock	0.07	-	Favourable Condition	Maintained at Favourable Condition
Low energy intertidal rock	0.01	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy infralittoral rock	0.03	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.03	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mud	0.01	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	0.04	-	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
stuarine rocky habitats	-	3	Favourable Condition	Maintained at Favourable Condition
Sheltered muddy gravels	0.07	-	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Anguilla anguilla</i>	-	-	To be determined	To be determined
SNCBs advise that the conservation objective for the European eel (<i>Anguilla anguilla</i>) is set to “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 Erme Estuary
Source of costs of the rMCZ under Policy Option 1	
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 under Policy Option 1
Post-Roman pottery scatter is recorded in the site. The Erme Estuary Wreck found in the site is designated as a historic shipwreck under the Protection of Wrecks Act 1973. Since 2003, one licence has been granted each year to survey the wreck. 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 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 Erme Estuary
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
The 0 to 20 year Shoreline Management Plan policies along the edge of the rMCZ advocate 'managed realignment' where possible instead of 'hold the line', and 'no active intervention' along undefended 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).	

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Erme Estuary
Recreation; research and education; water pollution from activities on land.	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale¹¹</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>									rMCZ Erme Estuary
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A1.1 High energy intertidal rock	BSH	✓	✓	✓ * 1	None	Maintain			
A1.2 Moderate energy	BSH	✓	✓	✓ * 1	None	Maintain			

¹¹ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

intertidal rock									
A1.3 Low energy intertidal rock	BSH	✓	✓	✓ * 1	None	Maintain			
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓ * 1	None	Maintain			
A2.4 Intertidal mixed sediments	BSH	✓	✓	✓ * 1	None	Maintain			
A3.1 High energy infralittoral rock	BSH	✓	✓	✓ * 1	None	Maintain			
A3.2 Moderate energy infralittoral rock	BSH	✓	✓	✓ * 1	None	Maintain			
A3.3 Low energy infralittoral rock	BSH	✓	✓	✓ * 1	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the largest area of low energy infralittoral rock	Only significant site proposed for this feature within the region	

Annex I2. Impact Assessment materials (Finding Sanctuary).

A5.2 Subtidal sand	BSH	✓	✓	✓ * 1	None	Maintain		Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
A5.3 Subtidal mud	BSH	✓	✓	✓ * 1	None	Maintain			
European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	✓	N/A	None	<i>Maintain / Recover</i> * 2			BAP and OSPAR
Estuarine rocky habitats	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Sheltered muddy gravels	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * 2					
Overlaps with existing MPAs				✓					

Annex I2. Impact Assessment materials (Finding Sanctuary).

Erme Estuary (Finding Sanctuary) (Natural England lead), within rMCZ 26. An overview of features proposed for designation within the Erme Estuary recommended reference area and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale

✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Where an asterisk (*) has been given in the table, more detail is provided in the narrative.

ENG Feature	Representativity	Viability	Recommended conservation objective
A3.3 Low energy infralittoral rock	BSH	X	Recover to reference condition
A5.3 Subtidal mud	BSH	X	Recover to reference condition
A2.5 Coastal salt marshes and saline reedbeds	BSH	X	Recover to reference condition
A2.4 Intertidal mixed sediments	BSH	X	Recover to reference condition
A2.3 Intertidal mud	BSH	X	Recover to reference condition
Sheltered muddy gravels	FOCI Habitat	X	Recover to reference condition
European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	Recover to reference condition
Site considerations			
Appropriate boundary	✓		

Additional comments and site benefits:

¹ Although this rMCZ does not meet the minimum viable size for BSHs (5km minimum diameter), the entire estuary unit is contained within the rMCZ boundary. Therefore this rMCZ is believed to be viable for all BSHs (using Natural England expert judgement).

² The estuary is a spawning ground for sea trout and also provides a habitat for a population of European Otters (SAD in (Lieberknecht, et al. 2011)).

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 5a. Fish and shellfish for human consumption		rMCZ Erme Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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.</p> <p>However, there is currently no commercial fishing within the rMCZ and therefore no value derived from on-site fisheries. It has not been possible to estimate the value derived from off-site fisheries as a result of the nursery area function.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence : Moderate</p>

Table 5b. Recreation		rMCZ Erme Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p>

Annex 12. Impact Assessment materials (Finding Sanctuary).


Table 5b. Recreation		rMCZ Erme Estuary
<p>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.</p> <p>At least 25 angling permits are issued (free of charge) each year and it is estimated that approximately 15 of the visitors staying at the holiday cottages fish on the estuary each year (Flete Estate, pers. comm., 2011). Therefore, at least 40 anglers (25 permit holders and 15 visitors) are expected to use the site each year. The water bailiff runs a charter boat business which includes angling charters within and outside the estuary. It has not been possible to estimate the value of angling in the site.</p>	<p>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).</p> <p>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.</p>	Confidence: Moderate
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
<p>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.</p> <p>Egrets, herons, kingfishers, curlews, oystercatchers and shelducks can be seen regularly at the estuary. Visitors to the estuary can also see otters on a regular basis. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ Erme Estuary
Baseline	Beneficial impact under Policy Option 1	

Table 5c. Research and education		rMCZ Erme Estuary
<p>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.</p> <p>Research activities are carried out under the Erme Estuary Management Plan, and the current plan seeks to encourage activities such as baseline and survey work of key habitats (Coast and Countryside Service, 2003). The Erme Estuary wreck and Erme Ingot heritage sites received approximately 50 dives a year between them (English Heritage, pers. comm., 2011). The full extent of current research activity carried out in the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Education activities at the estuary are not known. The Erme Estuary Management Plan seeks to encourage links with schools and public events such as lectures and walks (Coast and Countryside Service, 2003). In 2007, Bournemouth University used the Erme Ingot heritage site to train marine archaeology students. It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	<p>MCZ designation may provide an opportunity to expand the focus of education events in 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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Erme Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2012).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rocky habitats in estuaries</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>Designating the recommended Marine Conservation Zone (rMCZ) will protect</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Table 5d. Regulating services		rMCZ Erme Estuary
make a significant contribution to the overall diversity (Fletcher and others, 2012).	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
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 5e. Non-use and option values		rMCZ Erme Estuary
Baseline	Beneficial impact under Policy Option 1	
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 the option to benefit from the services in the future from the risk of future degradation.	Anticipated direction of change:  Confidence: Moderate

rMCZ Reference Area Erme Estuary

Site area (km²): 0.19

Table 1. Conservation impacts	rMCZ Reference Area Erme Estuary
1a. Ecological description	
Recommended Marine Conservation Zone Reference Area Erme Estuary sits in the upper extent of the estuary. The site boundary follows the mean high water mark on all banks. The Erme is a narrow, sheltered estuary and approximately 6.5km long. It is very secluded, has steep wooded banks and has been notified as a Site of Special	

Scientific Interest for its woodland habitat. It lies within an Area of Outstanding Natural Beauty and within the South Devon Heritage Coast.

The habitats are predominantly sedimentary with some broken sand scoured bedrock at the mouth. Mobile sediments near the channel have a typical crustacean–polychaete community characterised by the amphipods *Bathyporeia pilosa* and *Eurydice pulchra*. More sheltered sediment infaunal communities are characterised by ragworm *Hediste diversicolor*. Low shore shingle and cobble habitats are colonised by the brackish water algae *Fucus ceranoides*. The estuary is a spawning ground for sea trout and has a population of European otter.

European eel *Anguilla anguilla* has been reported in the estuary. Sampling of four major taxonomic groups has been carried out in the estuary for: oligochaetes; amphipod crustaceans (mainly *Gammarus* spp.); ragworm *Nereis diversicolor*, and either mysids (mainly *Neomysis integer*) or brown shrimp *Crangon crangon* (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
<i>Broad-scale Habitats</i>				
Low energy infralittoral rock	0.02	-	Favourable Condition	Recover to Reference Condition
Subtidal mud	< 0.01	-	Favourable Condition	Recover to Reference Condition
Coastal saltmarshes and saline reedbeds	0.04	-	Favourable Condition	Recover to Reference Condition
Intertidal mud	0.13	-	Favourable Condition	Recover to Reference Condition
<i>Habitats of Conservation Importance</i>				
Sheltered muddy gravels	0.07	-	Favourable 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 Erme Estuary
Source of costs of the rMCZ under Policy Option 1	
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 under Policy Option 1
The Peat Database holds a record at this location. 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 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 2b. Flood and coastal erosion risk management (coastal defence)		rMCZ Reference Area Erme Estuary
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
The 0 to 20 year Shoreline Management Plan policies along the edge of the rMCZ advocate 'managed realignment' where possible instead of 'hold the line', and 'no active intervention' along undefended 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	

Table 2b. Flood and coastal erosion risk management (coastal defence)	rMCZ Reference Area Erme Estuary
	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. Recreation	rMCZ Reference Area Erme Estuary
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>Recreational angling management scenario: Closure of rMCZ to recreational angling.</p> <p>Recreational boating: Closure of rMCZ to anchoring (except in emergency).</p> <p>Wildfowling management scenario: Closure of rMCZ to wildfowling.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>Recreational angling: The Erme Estuary is a 'several fishery' (one where the property rights to the fishery are bestowed to a specific individual or organisation). Angling on the estuary is permitted only for permit holders, people who fish with the water bailiff and people who are staying in one of the 9 holiday cottages in the area (Flete Estate, pers. comm., 2011).</p> <p>At least 25 angling permits are issued (free of charge) each year. In addition it is estimated that approximately 15 of the visitors staying at the holiday cottages on the edge of the estuary fish on the estuary each year (Flete Estate, pers. comm., 2011). Therefore at least 40 anglers (25 permit holders and 15 visitors) are expected to use the site each year.</p> <p>The water bailiff runs a charter boat business which includes angling charters within and outside the estuary. The number of anglers who use this service is not known. The water bailiff, together with the gamekeeper, also manages angling on the estuary on behalf the Flete Estate (Flete Estate, pers. comm., 2011).</p>	<p>The rMCZ does not cover the whole estuary, and better fishing is thought to be available outside the rMCZ (Flete Estate, pers. comm., 2011). However, the closure of the rMCZ to anglers would be expected to reduce the choice of marks and may affect the quality of fishing on the estuary. At least 40 anglers per year are expected to be affected by the rMCZ.</p> <p>Angling on the estuary is part of the attraction of the holiday cottages operated by the Flete Estate and other individuals. The rMCZ may reduce the quality of this attraction which may result in reduced rental income (Flete Estate, pers. comm., 2011). The rMCZ would remove an area potentially targeted by anglers who charter the water bailiff's boat. This may affect the number of individuals taken on angling trips by the water bailiff, affecting his business revenue.</p> <p>It should be noted that the water bailiff also provides effective on-the-ground policing of activities on the estuary. If the continuation of the role of water bailiff became unviable as a result of new rMCZ management then this would affect the level of policing of activities on the estuary, which might result in management measures being less strictly adhered to.</p>

Table 2c. Recreation	rMCZ Reference Area Erme Estuary
<p>The rMCZ covers an area of 0.19km² part way up the estuary, equivalent to approximately 15% of the estuary's main area. Angling takes place throughout the estuary, including in the pMCZ, although areas outside the pMCZ are thought to provide better fishing (Flete Estate, pers. comm., 2011). The key species targeted by anglers are primarily bass and mullet and occasionally dab.</p>	
<p>Recreational boating: Six recreational boats anchor in Saltercrease, which is within the rMCZ boundary. Three of these are linked to Saltercrease Cottage, a riverside rental property. These boats are occasionally anchored on the mudflats directly in front of the cottage. The three other boats over-winter in Saltercrease as it provides more shelter than the moorings further down the estuary. One of these boats belongs to the Erme Estuary water bailiff, who continues to regularly use his boat commercially from this location during the winter months (Flete Estate, pers. comm., 2012).</p>	<p>Saltercrease provides an appropriate sheltered area for over-wintering anchorages on the estuary and suitable alternatives are not available (Flete Estate, pers. comm., 2012). Because of this, vessel owners are expected to respond to the rMCZ by taking boats out of the water during winter months, rather than anchor them in Saltercrease. This may result in additional costs of use and storage for the boat owners. The additional time required to launch and remove a boat for each use may deter owners from using their boats during the winter, reducing the benefit they receive from the activity. For the water bailiff, this is likely to impact on the operation of his business, and may result in a loss of earnings (Flete Estate, pers. comm., 2012).</p> <p>Boats anchored on the mudflats will need to be removed from the water after each use. This may affect the frequency with which the boats are used, reducing boating activity. This may also impact on the attractiveness of the rental property Saltercrease Cottage (Flete Estate, pers. comm., 2012)</p>
<p>Wildfowling: Wildfowling occurs throughout much of the estuary, and the rMCZ covers the main and best area. Wildfowling typically occurs during the autumn and winter months. The species targeted within the estuary include mallard, wigeon, teal and occasionally snipe. There are 12 days of formal shoots per year, usually involving 8 people per shoot (equating to 96 individuals/yr), where guests participate by invitation only and under the supervision of the gamekeeper and/or landowner. There are also a few informal shoots each year. Dogs are used to collect the quarry as well as to chase pheasants, some of which are shot within the rMCZ. People who shoot at the estuary may stay in the holiday cottages, particularly Pamflete House,</p>	<p>Wildfowling within the rMCZ would not be permitted as it is extractive (Natural England, pers. comm., 2012) (JNCC and Natural England, 2010). The rMCZ covers the main and best area used for wildfowling within the estuary. The closure of the rMCZ to wildfowling could result in complete cessation of wildfowling within the estuary and an approximate loss of income to Flete Estate of at least £0.059m/yr (Flete Estate, 2011). If there was not sufficient demand for holiday lets for Pamflete House arising from its other attractions, this could further impact on the income of the Flete Estate. There could also be a loss of income for the owner of the hunting dogs used for the shoots.</p> <p>However, wildfowling may continue at a reduced level in areas of the estuary outside the rMCZ, but the quality of the wildfowling experience would be significantly lower than that</p>

Table 2c. Recreation	rMCZ Reference Area Erme Estuary
<p>located to the south-west of the rMCZ (Flete Estate, pers. comm., 2011).</p> <p>Flete Estate receives annual revenue of approximately £0.059m from wildfowling activities. This is an important part of the estate's annual income. People who go wildfowling and also stay in Pamflete House provide further income for the estate. The house is rented out for between £2,350 and £3,000 per week. The owner of the hunting dogs used for the shoots also receives an income from the activity (value not available) (Flete Estate, pers. comm., 2011).</p>	<p>provided by the area covered by the rMCZ.</p> <p>Approximately 96 individual wildfowlers per year would be expected to be affected by the rMCZ. While there are other locations for wildfowling in South Devon such as Kingsbridge, the River Tamar and the River Tavy (British Association for Shooting and Conservation, 2011), the Erme Estuary is considered to be unique in that it offers accommodation for wildfowlers (and their partners) and is by invitation only.</p>

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area Erme Estuary
Recreation (horse riding [subject to code of conduct], swimming, walking); research and education.	

Contribution to Ecological Network Guidance

This rRA sits within an rMCZ. For information on how this reference area contributes towards the guidelines in the Ecological Network Guidance please see the information provided underneath FS 26 Erme Estuary rMCZ. This is also taken from Annex 5 in JNCC and Natural England's Advice on rMCZs.

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 Erme Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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.</p> <p>However, there is currently no commercial fishing within the rMCZ and therefore no value derived from on-site fisheries. It has not been possible to estimate the value derived from off-site fisheries as a result of the nursery area function.</p>	<p>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 there is no current commercial fishing activity.</p> <p>No change in feature condition or harvesting of fish and shellfish is anticipated and no fishing will be permitted within the rMCZ. 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 anthropogenic pressures (as, if necessary, mitigation would be introduced, with the associated costs and benefits).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence Moderate</p>

Table 4b. Recreation		rMCZ Reference Area Erme Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 (see Table 1b).</p> <p>A description of on-site angling activity is set out in Table 2c. It has not been possible to estimate the value of angling at the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence Low</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	N/A	N/A

Table 4b. Recreation	rMCZ Reference Area Erme Estuary	
<p>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.</p> <p>Egrets, heron, kingfishers, curlew, oystercatcher and shelduck can be seen regularly at the estuary. Visitors to the estuary can also see otters on a regular basis. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence Low</p>

Table 4c. Research and education	rMCZ Reference Area Erme Estuary	
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>Research activities are carried out under the Erme Estuary Management Plan, which seeks to encourage activities such as baseline and survey work of key habitats (Coast and Countryside Service, 2003). The full extent of current research activity carried out at the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Education activities at the estuary are not known. The Erme Estuary Management Plan seeks to encourage linkages with schools and public events</p>	<p>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</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 4c. Research and education		rMCZ Reference Area Erme Estuary
such as lectures and walks (Coast and Countryside Service, 2003). It has not been possible to estimate the value derived from education activities associated with the rMCZ.	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).	Confidence: Moderate

Table 4d. Regulating services		rMCZ Reference Area Erme Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 <i>Spartina anglica</i>, which grows in intertidal mud (Fletcher and others, 2012).</p> <p>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).</p> <p>Natural hazard protection: The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>Improved habitat condition and a reduction in anthropogenic pressures may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 4e. Non-use and option values		rMCZ Reference Area Erme Estuary
Baseline	Beneficial impact under Policy Option 1	

Table 4e. Non-use and option values	rMCZ Reference Area Erme Estuary	
<p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

rMCZ Greater Haig Fras

Site area (km²): 2,040.95

Table 1. Conservation impacts				rMCZ Greater Haig Fras
1a. Ecological description				
<p>The western boundary of the recommended Marine Conservation Zone (rMCZ) is aligned with the UK Continental Shelf Limit. The remainder of the site encompasses the entirety of the geomorphological feature Haig Fras and Haig Fras candidate Special Area of Conservation, with surrounding areas of sediment. The easternmost boundary of the rMCZ is approximately 120km west of Land’s End.</p> <p>Greater Haig Fras is an isolated, fully submarine bedrock outcrop located in the soth-west offshore area. It is the only substantial area of rocky reef in the Celtic Sea beyond the coastal margin. It supports a variety of fauna, ranging from jewel anemones and Devonshire cup coral near the peak of the outcrop to encrusting sponges, crinoids and Ross coral towards the base of the rock (where boulders surround its edge). The rock is granite, mostly smooth with occasional fissures. The rocky outcrop protrudes from an area of surrounding sediment and is approximately 45km long, 15km wide and in one area rises to a peak 1km wide, which lies just 38 metres beneath the sea surface. Around the base of the shoal, boulders and cobbles partially embedded in sediment provide a complex habitat. Distinct biotopes are associated with both the rock habitat and the sediment ‘pockets’ which occur on the platform area.</p> <p>On the uppermost parts of the Haig Fras shoal, the exposed bedrock is dominated by the jewel anemone <i>Corynactis viridis</i>. This region also supports encrusting sponges and bryozoans, as well as mobile fauna such as the sea urchin <i>Echinus esculentus</i> and gastropod mollusc <i>Calliostoma</i> spp. At the shallowest depth surveyed (c. 52 metres), small patches of encrusting pink coralline algae were observed, indicating that the peak of the shoal protrudes into the photic zone. At depths of between 60 and 70 metres, the shoal bedrock is slightly covered in silt and is not widely colonised except by cup coral <i>Caryophyllia smithii</i> (which is abundant) and a few mobile species such as the urchin <i>Echinus esculentus</i>, gastropod mollusc <i>Calliostoma</i> spp. and crinoids (<i>Antedon</i> spp.). High numbers of cup corals have been seen on parts of the rock platform away from the shoal. At the base of the shoal, the rock is covered with a thin layer of fine calcareous sand and mud and supports cup sponges, erect branching sponges, <i>Caryophyllia smithii</i> (although in lower numbers than shallower parts of the shoal) and crinoids. The boulders and cobbles around the base of the shoal support encrusting sponge, <i>Caryophyllia smithii</i> and crinoids in low numbers; brittlestars, squat lobster (<i>Munida</i> spp.) and the Ross coral <i>Pentapora foliacea</i> (now <i>Pentapora fascialis</i>) are also present (Lieberknecht and others, 2011).</p>				
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	688.98	-	Unfavourable Condition	Recover to Favourable Condition

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Subtidal coarse sediment	413.46	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mixed sediments	115.79	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mud	236.39	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	316.79	-	Unfavourable Condition	Recover to Favourable Condition
<i>Geological and Geomorphological Features of Interest</i>				
Haig Fras rock complex	74.73	-	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 Greater Haig Fras
Source of costs of the rMCZ under Policy Option 1		
<p>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.</p> <p>Management scenario 1: No additional management.</p> <p>Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.</p> <p>Management scenario 3: Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, and hooks and lines.</p>		
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1
<p>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. Fishing in the rMCZ is dominated by French otter trawling (JNCC, pers. comm., 2012) and there is also a significant amount of gill netting, principally by UK vessels. Estimated total value of UK vessel landings from the rMCZ: £0.16m/yr.</p>		

Table 2a. Commercial fisheries		rMCZ Greater Haig Fras			
UK Bottom trawls: UK trawlers active in the wider area (defined as the International Council for the Exploration of the Sea [ICES] Rectangle 29E2) are typically beam trawlers of between 20 and 35 metres in length. Fishing effort in the rMCZ is low (MCZ Fisheries Model). Estimated value of UK bottom trawl landings from the rMCZ: £0.002m/yr.	Scenario 1: No impacts are anticipated under Scenario 1.				
	Scenarios 2 and 3: The rMCZ does not cover a known trawling ground (South West Fishing Industry Group, 2011) and landings from it are low. As such 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:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	
	Value of landings affected	0.000	0.002	0.002	
UK Nets: UK vessels active in the area around the rMCZ (defined as ICES Rectangles 29E1 and 29E2) are typically of between 15 and 20 metres in length and primarily use gill nets to target hake and Pollack (MMO, 2011a). Some vessels use both gill nets and trammel nets, using the latter to target turbot and monkfish (MMO, 2011a). Netting occurs throughout the rMCZ, but is concentrated in two areas, one in the far west of the rMCZ along the shelf break, the other in the south-east of the rMCZ following the area of circalittoral rock (MCZ Fisheries Model). Estimated value of UK net landings from the rMCZ: £0.158m/yr.	Scenarios 1 and 2: No impacts are anticipated under scenarios 1 and 2.				
	Scenario 3: A relatively high value of landings will be affected under this scenario. No further information on the 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	
	Value of landings affected	0.000	0.000	0.158	
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 under Policy Option 1					

Table 2a. Commercial fisheries		rMCZ Greater Haig Fras				
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:				
		<i>£m/yr</i>	Scenario 1	Scenario 2	Scenario 3	Best estimate
		Value of landings affected	0.000	0.002	0.160	0.010
		GVA affected	0.000	0.001	0.071	0.004
		The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.				
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). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.970m/yr; static gears: £0.081m/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. Scenarios 2 and 3: Non-UK vessels using bottom trawls/dredges (in particular French otter trawlers) and static gears would be affected by the rMCZ. In the event of a full closure of the rMCZ the estimated value of French landings affected would be £0.97m/yr (bottom trawls/dredges) and £0.081m/yr (static gears). No information on the effect of the zoned closure to static gears or the impact on other countries' vessels' value of landings is available.				

Table 2b. National defence	rMCZ Greater Haig Fras
Source of costs of the rMCZ under Policy Option 1	
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.	

Table 2b. National defence		rMCZ Greater Haig Fras
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
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 under Policy Option 1 and not for this site alone	rMCZ Greater Haig Fras
<p>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).</p> <p>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).</p>	

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Greater Haig Fras
Cables (existing interconnectors and telecom cables), commercial fishing (mid-water trawls)	

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ¹²									rMCZ Greater Haig Fras	
✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.										
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps shortfalls or in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale	
A4.2 Moderate energy circalittoral rock										
A5.1 Subtidal coarse sediment	BSH	✓	✓ * 1	✓	None	Recover	This BSH is currently only reaching the minimum adequacy target. This site makes a significant contribution towards meeting the lower level target for this	Only a small proportion of this BSH is currently protected within existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea Regional	

¹² copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

							feature within the MCZ regional project area		Sea.
A5.2 sand	Subtidal	BSH	✓	✓	✓	None	Recover	Only a small proportion of this feature is captured in existing MPAs.	
A5.3 mud	Subtidal	BSH	✓	✓	✓	None	Recover	Only a small proportion of this BSH is currently protected within existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea Regional Sea.
A5.4 mixed sediments	Subtidal	BSH	✓	✓	✓	None	Recover	This site makes a significant contribution towards meeting the lower level target for this feature within the regional	

Annex I2. Impact Assessment materials (Finding Sanctuary).

							MCZ project area		
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				Geological process feature – Haig Fras Rock Complex * ²					
Appropriate boundary				✓					
Areas of additional ecological importance				✓ * ³					
Overlaps with existing MPAs				Haig Fras SAC sits within the boundary of the rMCZ					

An overview of features proposed for designation within the Greater Haig Fras recommended reference area and how these contribute to the ENG guidelines at the regional MCZ project area and at a wider scale copied from JNCC and Natural England's advice on rMCZs

✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Where an asterisk (*) has been given in the table, more detail is provided in the narrative.

ENG Feature	Representativity	Viability	Recommended conservation objective
A4.2 Moderate energy circalittoral rock	BSH	✓	Recover to reference condition
A5.1 Subtidal coarse sediment	BSH	✓	Recover to reference condition
A5.2 Subtidal sand	BSH	✓	Recover to reference condition
A5.3 Subtidal mud	BSH	✓	Recover to reference condition
A5.4 Subtidal mixed sediments	BSH	✓	Recover to reference condition
Site considerations			

Appropriate boundary	✓
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Additional comments and site benefits:

¹ The adequacy target for subtidal coarse sediment has only just been achieved within this regional MCZ project area.

² Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these).

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 5a. Fish and shellfish for human consumption		rMCZ Greater Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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 provided is assumed to be commensurate with that provided by the features of the site when in unfavourable condition.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>If the conservation objectives of the features are achieved, the habitats 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, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks.</p> <p>The rMCZ is relatively large and the improvement in habitat condition and 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.</p> <p>The potential effects described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>


Table 5a. Fish and shellfish for human consumption		rMCZ Greater Haig Fras
	site impacts of displaced effort.	

Table 5b. Recreation		rMCZ Greater Haig Fras
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ Greater Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The rMCZ overlaps a Special Area of Conservation and research activities may occur as a result of the designation.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>

Table 5c. Research and education		rMCZ Greater Haig Fras
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ Greater Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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 extremely high biodiversity (Fletcher and others, 2012).</p> <p>Natural hazard protection: As the site is offshore, it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Greater Haig Fras
Baseline	Beneficial impact under Policy Option 1	
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.	Anticipated direction of change:  Confidence: Moderate

rMCZ Reference Area Haig Fras**Site area (km²): 148.23**

Table 1. Conservation impacts	rMCZ Reference Area Haig Fras
1a. Ecological description	
<p>The recommended Marine Conservation Zone (rMCZ) has a depth ranging from 76 to 132 metres below sea level and is located approximately 155km off Land's End. It intersects with the Haig Fras rock complex, an Ecological Network Guidance-listed geological/geomorphological feature of importance. The rMCZ boundary contains 5.0% (3.71 km²) of the feature.</p> <p>Greater Haig Fras is an isolated, fully submarine bedrock outcrop located in the south-west offshore area, 95km north-west of the Isles of Scilly. It is the only substantial area of rocky reef in the Celtic Sea beyond the coastal margin. It supports a variety of fauna, ranging from jewel anemones and Devonshire cup coral near the peak of the outcrop to encrusting sponges, crinoids and Ross coral towards the base of the rock (where boulders surround its edge). The rock is granite, mostly smooth with occasional fissures. The rocky outcrop protrudes from an area of surrounding sediment and is approximately 45km long, 15km wide and in one area rises to a peak 1km wide, which lies just 38 metres beneath the sea surface. Around the base of the shoal, boulders and cobbles partially embedded in sediment provide a complex habitat. Distinct biotopes are associated with both the rock habitat and the sediment 'pockets' which occur on the platform area (Lieberknecht and others, 2011).</p>	
1b. MCZ Feature Baseline and Impact of MCZ	

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Moderate energy circalittoral rock	30.01	-	Unfavourable Condition	Recover to Reference Condition
Subtidal coarse sediment	48.20	-	Unfavourable Condition	Recover to Reference Condition
Subtidal mixed sediments	54.45	-	Unfavourable Condition	Recover to Reference Condition
Subtidal mud	8.50	-	Unfavourable Condition	Recover to Reference Condition
Subtidal sand	7.06	-	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 Haig Fras
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p> <p>Management scenario 1: Closure of entire rMCZ to all commercial fishing gears, except mid-water trawls.</p> <p>Management scenario 2: Closure of entire rMCZ to all commercial fishing.</p>		
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1
<p>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. Fishing in the rMCZ is dominated by gill netting, principally by UK vessels. There is also a high level of French otter trawl effort in the rMCZ (Lee, 2010). Estimated total value of UK vessel</p>		

Table 2a. Commercial fisheries		rMCZ Reference Area Haig Fras		
landings from the rMCZ: £0.017m/yr.				
UK Nets: UK vessels active in the area around the rMCZ (defined as the International Council for the Exploration of the Sea [ICES] Rectangles 29E1 and 29E2) are typically of between 15 and 20 metres in length and primarily use gill nets to target hake and Pollack (MMO, 2011a). Some vessels use both gill nets and trammel nets, using the latter to target turbot and monkfish (MMO, 2011a). Estimated value of UK net landings from the rMCZ: £0.017m/yr.	Scenarios 1 and 2: The rMCZ covers a small proportion of the area targeted by fishers, and displaced vessels may increase their effort in the area surrounding the rMCZ. This may affect catch rates for all netters active in the wider area.			
	Estimated annual value of UK net landings affected is expected to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	
Value of landings affected	0.017	0.017		
Total direct impact under Policy Option 1				
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	Best estimate
	Value of landings affected	0.017	0.017	0.004
	GVA affected	0.008	0.008	0.002
The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenarios occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.				
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). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.047m/yr; static gears: £0.008m/yr (Direction des Pêches Maritimes et de l’ Aquaculture, 2011). Estimates for other countries are not available.	Scenario 1: Non-UK vessels using static gears and bottom trawls/dredges, in particular French otter trawlers, would be affected by the rMCZ. In the event of a full closure of the rMCZ the estimated value of French landings affected would be: £0.047m/yr (bottom trawls/dredges) and £0.008m/yr (static gears). No information on the effect on other countries’ vessels’ value of landings is available.			
Scenario 2: In addition to the impacts described under Scenario 1, non-UK mid-water				

Table 2a. Commercial fisheries	rMCZ Reference Area Haig Fras
	trawlers will also be affected under Scenario 2. No further information on the impacts of the rMCZ was received from non-UK fisheries organisations/associations. It has not been possible to obtain information on the value of non-UK vessels' landings affected by the rMCZ.

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area Haig Fras
None.	

Contribution to Ecological Network Guidance

This rRA sits within an rMCZ. For information on how this reference area contributes towards the guidelines in the Ecological Network Guidance please see the information provided underneath FS 05 Greater Haig Fras rMCZ. This is also taken from Annex 5 in JNCC and Natural England's Advice on rMCZs

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 Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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 provided is assumed to be commensurate with that provided by the features of the site when in unfavourable condition.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>If the conservation objectives of the features are achieved, the habitats 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 2a.</p> <p>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.</p> <p>As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 4b. Recreation		rMCZ Reference Area Haig Fras
Baseline	Beneficial impact under Policy Option 1	
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 Reference Area Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The rMCZ overlaps with a Special Area of Conservation and existing research activities may occur as a result of the designation.</p>	<p>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, 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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 4d. Regulating services		rMCZ Reference Area Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>Environmental resilience: The features of the site contribute to the resilience</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 4d. Regulating services	rMCZ Reference Area Haig Fras
<p>and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats and rock habitats can support extremely high biodiversity (Fletcher and others, 2012).</p> <p>Natural hazard protection: As the site is offshore, its features are not thought to contribute to the delivery of this service (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>Confidence: Low</p>

Table 4e. Non-use and option values	rMCZ Reference Area Haig Fras
Baseline	Beneficial impact under Policy Option 1
<p>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.</p>	<p>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.</p> <p>Anticipated direction of change:  Confidence: Moderate</p>

rMCZ Hartland Point to Tintagel

Site area (km²): 303.8

Table 1. Conservation impacts				rMCZ Hartland Point to Tintagel
1a. Ecological description				
<p>The site boundary follows the coastline along the mean high water mark from Tintagel Head to Hartland Point. The seaward boundary is made up of three distinct areas. Virtually the entire stretch of coastline along the recommended Marine Conservation Zone (rMCZ) is designated as a Site of Special Scientific Interest (SSSI), for the most part including the intertidal area and therefore intersecting with the rMCZ.</p> <p>The coastline of the rMCZ is exposed to high levels of wave energy and is characterised by steep rocky cliffs, sea caves and stretches of sandy surf beaches. The site extends from the shoreline to depths of approximately 50 metres. The rMCZ intersects with an area of higher than average benthic species diversity, and the Bude and Boscastle sections intersect with areas of higher than average benthic habitat diversity.</p> <p>Bude Bay faces west and is fully exposed to the Atlantic; north of Bude, the shoreline is a long sandy beach interrupted by high rock outcrops, some extending to the level of low water neap tides, while to the south of Bude the mid-low intertidal zone is a rock platform of east-west orientated reefs, except for a long stretch of sand at Widemouth. Mussel <i>Mytilus edulis</i> beds are extensive in the northern half of the bay, but colonies are scarce in the south.</p> <p>More generally, the near-shore sublittoral regions are composed of gently sloping bedrock, occasionally very broken, with boulders at some sites; rock surfaces have an even covering of sand. These habitats are dominated by algae. Infralittoral algal communities cover a very wide depth range. Infralittoral communities are dominated by foliose red algae; <i>Dictyota dichotoma</i> and <i>Dictyopteris membranacea</i> are abundant. A number of other notable species of algae has also been recorded in the rMCZ, for example the Mediterranean species <i>Choristocarpus tenellus</i>. Vertical and upward facing rock is dominated by bryozoans, sea squirts and sponges; erect sponges such as <i>Raspailia hispida</i> are common. At Duckpool, a small, sheltered sandy bay, the lower shore habitats have exceptionally fine colonies of the reef-building tubeworm <i>Sabellaria alveolata</i>.</p> <p><i>Eunicella verrucosa</i> and short-snouted seahorse have been reported in the rMCZ; the northern stretch of the rMCZ is considered important for cetaceans. Clumps of potato crisp bryozoan together with branching sponges have been identified in the rMCZ, indicating a probable fragile sponge and anthozoan community (Lieberknecht and others, 2011).</p> <p>Breeding razorbill <i>Alca torda</i>, guillemot <i>Uria aalge</i> and herring gull <i>Larus argentatus</i>, protected through the adjacent SSSI, use the area of the rMCZ for loafing, preening and roosting (RSPB, pers. comm., 2012).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				

Annex I2. Impact Assessment materials (Finding Sanctuary).

Coastal saltmarsh and saline reedbeds	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
High energy infralittoral rock	1.43	-	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	1.76	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	1.56	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.79	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	1.40	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.22	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.01	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	155.64	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	141.07	-	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
Fragile sponge and anthozoan communities on subtidal rocky habitats	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Sabellaria alveolata</i> reefs	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Eunicella verrucosa</i>	-	5	To be determined	To be determined
SNCBs advise that the conservation objective for the pink sea fan (<i>Eunicella verrucosa</i>) is set to “Maintained at Favourable Condition”.				
<i>Padina pavonica</i>	-	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 Hartland Point to Tintagel
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
There is a series of World War II anti-tank obstacles situated at Crackington Haven, Widemouth Beach, the entrance to Bude Canal Basin and Budehaven although it is not clear whether these are located in the site. Fishers have reported 12 wrecks in the area, and there are several further possible wrecks. There is evidence of Romano-British and early medieval settlement, and a medieval church, castle and associated features on Tintagel Island and the adjoining mainland. The Chapel of the Holy Trinity and St Michael are situated at the end of the breakwater. An unusual design of a World War II reinforced concrete pillbox is located there, situated at Wrangle Point on the cliffs at the north end of Crooklets Beach, Bude. Peat is recorded in the area. Again, it is not clear whether these features are located 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 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 Hartland Point to Tintagel	
Source of costs of the rMCZ under Policy Option 1			
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 under Policy Option 1	
Overview: The rMCZ is predominantly inside 6nm (nautical miles) and a number of commercial fishing restrictions are already in existence (listed in Annex E). There are small fishing fleets at Bude and Boscastle that typically operate a mix of static gears, principally pots and nets, throughout much of the rMCZ. Potters from Padstow also fish in the area. Bottom trawlers from North Devon fish within the rMCZ, although the level of effort is low as most of their activity is further north (South West Fishing Industry Group, 2011). The far western corner of the rMCZ is outside 6nm and is fished by UK, French and Belgian bottom trawlers outside the seasonal Trevose closure (see Annex E for an explanation of the Trevose closure). The area of the Trevose closure overlaps with the part of the rMCZ that is outside 6nm. Estimated total value of UK vessel landings from the rMCZ: £0.196m/yr.			
UK Dredges: There is no regular dredging in the rMCZ (MCZ Fisheries Model). However, in recent years there is thought to have been some dredging effort around the north-west corner of the rMCZ, inside 6nm (Cornwall Inland Fisheries and Conservation Authority (IFCA), pers. comm., 2012). This suggests that dredging effort in the rMCZ may increase in future. Estimated value of UK dredge landings from the rMCZ: £0.000m/yr.		Scenario 1: No impacts are anticipated under this scenario. Scenario 2: The rMCZ is not currently a regular scalloping ground and no immediate impacts of a closure are anticipated. However, the recent increase in effort around the north-west of the rMCZ indicates the potential for landings from the rMCZ to occur. The closure will remove this potential fishing ground option for vessels dredging in the area. 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	0.000

Table 2b. Commercial fisheries		rMCZ Hartland Point to Tintagel												
<p>UK Bottom trawls: There is a low level of bottom trawl activity in the rMCZ, principally by vessels from Padstow and North Devon ports targeting sole and bass (South West Fishing Industry Group, 2011). Historically there has been trawling by North Devon fishers over the Hartland Patch (North Devon Fishermen’s Association, pers. comm., 2011), which covers part of the rMCZ, although this is currently thought to be a low level of activity (Cornwall IFCA and Devon and Severn IFCA, pers. comm., 2011). Much of this activity occurs in a corridor that is outside the rMCZ and runs between the western and eastern halves of the rMCZ (Bottom trawl owner, pers. comm., 2011).</p> <p>The Trevose closure, within which fishing with dredges, bottom trawls and nets is not permitted from 1 February to 31 March, overlaps with the part of the rMCZ that is outside 6nm. When the Trevose closure is in force, vessels, many of which are under 10 metres, fish along the edges of the closed area inside 6nm (Armstrong and others, 2007) including the area inside the rMCZ (South West Fishing Industry Group, 2011). Estimated value of UK bottom trawl landings from the rMCZ: £0.006m/yr.</p>	<p>Scenario 1: No impacts are anticipated under this scenario.</p> <p>Scenario 2: The rMCZ is not heavily fished and average landings from it are low (MCZ Fisheries Model). While the effect of displacement arising as a result of closure to bottom trawls is therefore expected to be limited, the closure would remove a potential fishing ground option from the fleet, particularly when the Trevose closure is in effect. This will push vessels to the south or north during this time, to areas where existing fishing effort is greater. It may also result in additional unproductive steaming time for vessels travelling from ports in the north to fishing grounds south of the rMCZ, and <i>vice versa</i>.</p> <p>Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:</p>													
	<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>0.006</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.006					
£m/yr	Scenario 1	Scenario 2												
Value of landings affected	0.000	0.006												
Total direct impact under Policy Option 1														
<p>Total direct impact on UK commercial fishing</p>	<p>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:</p>													
	<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.006</td><td></td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.002</td><td></td></tr></table> <p>The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.</p>			£m/yr	Scenario 1	Scenario 2	Best estimate	Value of landings affected	0.000	0.006		GVA affected	0.000	0.002
£m/yr	Scenario 1	Scenario 2	Best estimate											
Value of landings affected	0.000	0.006												
GVA affected	0.000	0.002												

Table 2b. Commercial fisheries	rMCZ Hartland Point to Tintagel
<p>Impact on non-UK commercial fishing: Only a small area of the rMCZ, which is outside 6nm, is targeted by non-UK vessels. There is a low level of fishing effort by non-UK vessels using bottom trawls/dredges within the rMCZ (Lee, 2010).</p> <p>Estimated value of landings from the rMCZ by French vessels: £0.000m/yr (all gear types) (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>Scenario 2: Non-UK vessels using bottom trawls/dredges will be affected by closure of the part of the rMCZ that is outside 6nm. Given the small area of the rMCZ open to non-UK fishers, no significant impacts are anticipated.</p>

Table 2c. Flood and coastal erosion risk management (coastal defence)	rMCZ Hartland Point to Tintagel
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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).</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>The 0 to 20 year Shoreline Management Plan policies advocate 'no active intervention' along most of the coastline of the rMCZ, with 'hold the line' around developed areas. Schemes may come forward as a result of the hold the line policy (Environment Agency, pers. comm., 2012).</p>	<p>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).</p>

Table 2d. Ports, harbours, shipping and disposal sites		rMCZ Hartland Point to Tintagel	
Source of costs of the rMCZ under Policy Option 1			
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 under Policy Option 1		
<u>Harbour development:</u> Boscastle Harbour and Bude Harbour are both situated on the coastline of the rMCZ. There are no known plans for developments at either harbour.	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.000	<0.001*
*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.			
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 2e. Renewable energy		rMCZ Hartland Point to Tintagel							
Source of costs of the rMCZ under Policy Option 1									
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		Costs of impact of rMCZ on the sector under Policy Option 1							
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) covering 1.3% of the PDA. The rMCZ covers 2.3% 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 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).		Tidal energy: The estimated cost to tidal 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>		£m (one-off cost)	Scenario 1	Scenario 2	Cost to the operator	0.016	At least 0.016
		£m (one-off cost)	Scenario 1	Scenario 2					
Cost to the operator	0.016	At least 0.016							
<p>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 tidal energy installation would need to consider the possible effects of the construction and operational activities on the features protected by the rMCZ and 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).</p> <p>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.</p> <p>The likelihood and magnitude of any additional costs cannot be calculated. However,</p>									

Table 2e. Renewable energy		rMCZ Hartland Point to Tintagel							
		<p>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.</p> <p>The impacts that are assessed in both scenarios are based on JNCC and Natural England’s advice on the mitigation that could be required.</p>							
<p>Wave energy: The rMCZ overlaps with the North Cornwall and Devon Coastal wave energy PDA (PMSS, 2010). Any likely installation could have a footprint within the PDA of 50km² (PMSS, 2010) covering 1.5% of the PDA. The rMCZ covers 7.1% of the PDA. As the location of the potential installation is not known, the possible overlap of 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 2030 (DECC, pers. comm., 2011). The development in the PDA is expected to have a production capacity of 100MW (PMSS, 2010)</p>		<p>Wave energy: The estimated cost to wave energy developers of this rMCZ is expected to fall within the following range of scenarios:</p>							
		<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>	£m (one-off cost)	Scenario 1	Scenario 2	Cost to the operator	0.016	At least 0.016	
	£m (one-off cost)	Scenario 1	Scenario 2						
Cost to the operator	0.016	At least 0.016							
		<p>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 would 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 2030 (based on an average cost provided by renewable energy sector developers; see Annex N for details).</p> <p>Scenario 2: In addition to the costs set out under scenario 1, further costs may occur under Scenario 2 if use of removable frond mattresses for cable protection is required to mitigate the impacts of scour protection.. As the actual location of the potential installation is unknown, it is unclear whether any cables will need to 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. However, the likelihood and magnitude of any additional costs cannot be calculated.</p>							

Table 2f. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Hartland Point to Tintagel
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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Hartland Point to Tintagel
Cables (existing interconnectors and telecom cables), commercial Commercial fishing (pots and traps, nets); recreation; research and education.	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale¹³</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>	rMCZ Hartland Point to Tintagel
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¹³ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A1.1 High energy intertidal rock	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the largest area of high energy intertidal rock	This site is key in meeting connectivity in FS Regional Project Area	Out of all the rMCZs in the project area, this site contributes the largest area of high energy intertidal rock
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project Area	
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the largest area of intertidal coarse sediment	This site is key in meeting connectivity in FS Regional Project Area	Out of all the rMCZs in the project area, this site contributes the largest area of intertidal coarse sediment
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project	

Annex I2. Impact Assessment materials (Finding Sanctuary).

								Area	
A2.3 Intertidal mud	BSH	✓	✓	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project Area	
A2.4 Intertidal mixed sediments	BSH	✓	✓ * 1	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the largest area of intertidal mixed sediments. This site is needed to meet the lower level adequacy target for this feature within the FS MCZ area	This site is key in meeting connectivity in FS Regional Project Area	Out of all the rMCZs in the project area, this site contributes the second largest area of intertidal mixed sediments
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	N/A	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project Area	
A3.1 High energy infralittoral rock	BSH	✓	✓	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project Area	

Annex 12. Impact Assessment materials (Finding Sanctuary).

A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Maintain	This BSH is currently only reaching the minimum adequacy target	Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Maintain		Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
Pink sea-fan <i>Eunicella verrucosa</i>	FOCI Species	✓	✓	✓ * 2	None	Maintain			BAP and WCA species
Fragile sponge and anthozoan communities on subtidal rocky habitat	FOCI Habitat	✓ * 3	✓	✓ * 3	None	Maintain			BAP habitat
Peacock's tail <i>Padina pavonica</i>	FOCI Species	✓ * 4	✓	✓ * 5	None	Maintain	This FOCI is currently only reaching the minimum replication target.	This feature is not protected within existing MPAs within the FS area	BAP species
Honeycomb worm <i>Sabellaria alveolata</i> reefs	FOCI species	✓	✓	✓ * 6	None	Maintain			BAP species

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Site considerations	
Connectivity	✓ * 8
Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓ * 7
Overlaps with existing MPAs	None

Additional comments and site benefits:

¹ This site is needed to meet the lower level adequacy target for intertidal mixed sediments within the FS MCZ area.

² Viability for FOCI species *Eunicella verrucosa* requires a minimum patch diameter of 5km. A 5km area encompassing the record is possible within the rMCZ.

³ Viability for FOCI habitat Fragile sponge and anthozoan communities on subtidal rocky habitat requires a minimum patch diameter of 0.5km. A 500m area encompassing the record is possible within the rMCZ.

⁴ This feature (*Padina pavonica*) only has the minimum amount of replicates.

⁵ Viability for FOCI species *Padina pavonica* requires a minimum patch diameter of 0.5km. A 500m area encompassing the record is possible within the rMCZ.

⁶ Viability for FOCI habitat *Sabellaria alveolata* reefs requires a minimum patch diameter of 0.5km. A 500m area encompassing the record is possible within the rMCZ.

⁷ This site may be important for porbeagle sharks (SAD in (Lieberknecht, et al. 2011)).

⁸ This site is critical for connectivity along the north coast of Devon and Cornwall, which currently has no MPAs other than Lundy.

MCZs are critical for the protection of the BSHs subtidal coarse sediment and subtidal sand in this region. This site contains the second largest area of this feature within the inshore area.

This site is one of only three proposed for *Padina pavonica*.

The site intersects with an area of higher than average benthic diversity (SAD in (Lieberknecht, et al. 2011)).

The site contains notable *Sabellaria alveolata* reefs. Their importance has been highlighted by several scientists from the Marine Biological Association (pers comm). They have been described in scientific literature as 'exceptionally fine' (SAD in (Lieberknecht, et al. 2011)).

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 5a. Fish and shellfish for human consumption		rMCZ Hartland Point to Tintagel
Baseline	Beneficial impact under Policy Option 1	
<p>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 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 in favourable and unfavourable condition (see Table 1b).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable 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.</p> <p>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. Stocks of low-mobility and site-attached species, such as lobsters and crabs, may improve as a result of a recovery in the condition of circalittoral rock habitat and reduced fishing pressure. If some fishing for such species is permitted within the rMCZ, then catches may improve. Localised beneficial spill-over effects may occur around the rMCZ.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Hartland Point to Tintagel
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>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.</p> <p>Shore fishing is popular at points along the coastline and there are various rock platforms for sea fishing around Tintagel. Species include mackerel, pollack, wrasse and garfish. There are two sea fishing charters based at Bude. It has not been possible to estimate the value of angling at the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>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.</p> <p>Diving takes place in the rMCZ, including at the SS <i>Anna Sophie</i> and sites around Dizzard Point and Cambeak. It has not been possible to estimate the value of diving at the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to diving are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>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</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no</p>	<p>Anticipated direction of change:</p>


Table 5b. Recreation		rMCZ Hartland Point to Tintagel
<p>provided by the features of the site when in favourable condition.</p> <p>There are many nature reserves, walks and bird-watching points around Tintagel. Lye Rock, visible from Tintagel, is a breeding site for puffins and a variety of other birds, including peregrine falcon, razorbill, shag, kittiwake, great black-backed gull, lesser black-backed gull, herring gull and fulmar. The <i>Ilfracombe Princess</i> offers wildlife cruises, which offer views of Hartland Point and provide sightings of seals and porpoises for visitors. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	 <p>Confidence: Moderate</p>



Table 5c. Research and education		rMCZ Hartland Point to Tintagel
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The northern part of the rMCZ is situated within North Devon's Biosphere Reserve, through which a variety of research activities are undertaken. The full extent of current research activities carried out at the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The northern part of the rMCZ is situated within North Devon's Biosphere Reserve and is therefore linked into a number of UNESCO education programmes. Educational resources for schools are provided and online educational tools are also available (at www.northdevonbiosphere.org.uk).</p>	<p>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</p>	<p>Anticipated direction of change:</p> 

Table 5c. Research and education		rMCZ Hartland Point to Tintagel
Education events with a specific marine and coastal theme are organised in and around the rMCZ by Coastwise North Devon. There is a World Heritage Site at Hartland Quay. The full extent of education activities is not known. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	newspapers, and educational resources developed for use in schools).	Confidence: Moderate

Table 5d. Regulating services		rMCZ Hartland Point to Tintagel
Baseline	Beneficial impact under Policy Option 1	
<p>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 <i>Spartina anglica</i>, which grows in intertidal mud. 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).</p> <p>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).</p> <p>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).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>A potential reduction in anthropogenic pressures, including from the use of bottom-towed fishing gear, may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values	rMCZ Hartland Point to Tintagel
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Table 5e. Non-use and option values		rMCZ Hartland Point to Tintagel
Baseline	Beneficial impact under Policy Option 1	
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.	<p>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.</p> <p>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 biodiversity of the site area, with the most common reasons being because of the 'spectacular scenery' and because 'the whole place is amazing'.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Land's End**Site area (km²): 18.6**

Table 1. Conservation impacts	rMCZ Land's End
1a. Ecological description	
<p>The site boundary follows the coastline along the mean high water mark from Treen Cliff/Cribba Head to Gwennap Head. The seaward boundary extends westwards for about 3.5km and then runs back in an arc towards Cribba Head. The site occupies a depth range of between 0 and approximately 60 metres. Two coastal Sites of Special Scientific Interest are located alongside this recommended Marine Conservation Zone (rMCZ).</p> <p>The rMCZ intersects with an area of higher than average benthic species diversity. It contains the Runnelstone reef, which is ecologically of high importance for a large range of mobile species, including sea birds, cetaceans and basking shark, which use the site as a feeding area. It is also an important haul-out and pupping location for grey seal. The area is of importance for migratory sea birds, including Balearic shearwater <i>Puffinus mauretanicus</i>, auks, kittiwakes and gannets.</p> <p>This site encompasses an arc of sea area around an exposed shoreline with granite cliffs and sandy inlets. The area contains fine examples of very exposed rocky shore communities. Upper shores are dominated by barnacles, limpets and winkles. Low shores are carpeted with the pink tufted coralline alga <i>Corallina officinalis</i> and overlain</p>	

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with the kelp *Alaria esculenta*.

Halicystus auricula and *Palinurus elephas* have been recorded close to the boundaries of the rMCZ and may also be present within it. The Land's End peninsula (from Penzance to St Ives) is the only place in the region where the gooseneck barnacle *Pollicipes pollicipes* has been recorded, including near Land's End itself, at Sennen Cove and at Tater Du.

Sublittoral habitats and communities surveys have shown a dense forest of *Laminaria hyperborea* covering the shallow horizontal surfaces, with an understorey dominated by foliose red, green and brown algae. The sublittoral fringe recorded at Porthcurno contained *Alaria esculenta*, *Himanthalia elongata*, *Mytilus edulis* and coralline red algae. With increasing depth, vertical surfaces become dominated by *Corynactis* and *Metridium*, with tubes of jassid amphipods prevalent on upfaces. At 34 metres at Carn Base, several other species were documented, including *Holothuria*, *Stolonia socialis* and *Raspailia*, all of which occurred in shallow water at more sheltered sites (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
<i>Broad-scale Habitats</i>				
High energy circalittoral rock	0.09	-	Favourable Condition	Maintained at Favourable Condition
High energy infralittoral rock	3.36	-	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	0.03	-	Favourable Condition	Maintained at Favourable Condition
SNCBs advise that this feature is removed.				
Intertidal sand and muddy sand	0.02	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy circalittoral rock	1.74	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy infralittoral rock	0.27	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	1.92	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	11.09	-	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Euinella verrucosa</i>	-	2	Favourable Condition	Maintained at Favourable Condition

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<i>Paludinella littorina</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Non-ENG Mobile Species</i>				
<i>Phocoena phocoena</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Cetorhinus maximus</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Tursiops truncatus</i>	-	-	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 Land's End
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
There are 27 wrecks located 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. National defence	rMCZ Land's End
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Table 2b. National defence		rMCZ Land's End
Source of costs of the rMCZ under Policy Option 1 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 under Policy Option 1	
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 Land's End
Source of costs of the rMCZ under Policy Option 1 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	Costs of impact of rMCZ on the sector under Policy Option 1	
Wave energy: The rMCZ overlaps with the South Cornwall Coastal wave energy Potential Development Area (PDA) (PMSS, 2010). Any potential	Wave energy: The estimated cost to wave energy developers of this rMCZ is expected to fall within the following range of scenarios:	

Table 2c. Renewable energy	rMCZ Land's End		
<p>installation could have a footprint within the PDA of 20km², covering 0.4% of the PDA (PMSS, 2010). The rMCZ covers 0.002% of the PDA. As the location of the potential installation is not known, the possible overlap of 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 2030 (Department of Energy and Climate Change, pers. comm., 2011). The development in the PDA is expected to have a production capacity of 150MW (PMSS, 2010).</p>	£m (one-off cost)	Scenario 1	Scenario 2
	Cost to the operator	0.016	At least 0.016
	<p>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).</p> <p>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.</p> <p>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.</p> <p>The impacts that are assessed in both scenarios are based on JNCC and Natural England's advice on the mitigation that could be required.</p>		

Table 2d. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Land's End
<p>Cables (interconnectors and telecom cables): Future interconnectors and telecom cables may pass through the rMCZ. Impacts of rMCZs on future interconnectors and</p>	

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Land's End
Cables (existing interconnectors and telecom cables); commercial fishing (dredges, bottom trawls, pots and traps, nets, hooks and lines); recreation; research and education; water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ¹⁴									rMCZ Land’s End
✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.									
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale

¹⁴ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

					guidelines				
A5.1 Subtidal coarse sediment	BSH	✓	✓	X	Minimum adequacy target achieved	Maintain		This site intersects with an area of higher than average benthic species diversity	
A5.2 Subtidal sand	BSH	✓	✓	X	This site has not met the ENG target for viability	Maintain		This site intersects with an area of higher than average benthic species diversity	
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	X	This site has not met the ENG target for viability	Maintain		This site intersects with an area of higher than average benthic species diversity	
A3.2 Moderate energy infralittoral rock	BSH	✓	✓	X	This site has not met the ENG target for viability	Maintain		This site intersects with an area of higher than average benthic species diversity	
A4.1 High energy circalittoral	BSH	✓	✓	X	This site has not met the ENG target	Maintain		This site intersects with an area of higher	

Annex I2. Impact Assessment materials (Finding Sanctuary).

rock					for viability			than average benthic species diversity	
A3.1 High energy infralittoral rock	BSH	✓	✓	X	This site has not met the ENG target for viability	Maintain		This site intersects with an area of higher than average benthic species diversity	
A1.1 High energy intertidal rock	BSH	✓	✓	X	This site has not met the ENG target for viability	Maintain		This site intersects with an area of higher than average benthic species diversity	
A2.1 Intertidal coarse sediment	BSH	✓	✓	X	This site has not met the ENG target for viability	Maintain			
A2.3 Intertidal mud	BSH							Feature does not exist here and should be removed	
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	X	This site has not met the ENG target for viability	Maintain			
Pink sea-fan <i>Eunicella</i>	FOCI	✓	X	X	This site has not met the	Maintain			This feature has a limited

Annex I2. Impact Assessment materials (Finding Sanctuary).

<i>verrucosa</i>	Species				ENG target for viability				national distribution.
Sea snail <i>Paludinella littorina</i>	FOCI Species	✓	✓	✓	None	Maintain			Rare / limited distribution at UK level.
Basking shark <i>Cetorhinus maximus</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain		Recognised national 'hot spot' feeding area for <i>Cetorhinus maximus</i> * ⁴	The basking shark is considered globally vulnerable, and endangered in north-east Atlantic. (www.iucnredlist.org).
Bottlenose dolphin <i>Tursiops truncates</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain		Land's End is a locally important feeding area for small cetaceans.	UK BAP priority species.
arbour porpoise <i>Phocoena phocoena</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain		Land's End is a locally important feeding area for small cetaceans.	UK BAP priority species. OSPAR List of threatened and/or declining species.
Seabirds (species to be confirmed)	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain		Area is of importance for migratory species including Balearic shearwaters, auks, kittiwakes and gannets.	Area is of important for migratory species including Balearic shearwaters, auks, kittiwakes and gannets.
Site considerations									

Annex I2. Impact Assessment materials (Finding Sanctuary).

Connectivity	✓
Geological/Geomorphological features of interest	None
Appropriate boundary	X
Areas of Additional Ecological Importance	✓ * 1, 2, 3
Overlaps with existing MPAs	None

Additional comments and site benefits:

¹ Land's End is a well-recognised national 'hot spot' / feeding area for *Cetorhinus maximus* in the spring/summer months.

² The Land's End rMCZ contains the Runnelstone reef – an area of high ecological importance for a large range of mobile species, including seabirds, cetaceans, and basking sharks who use the rMCZ as a feeding area (SAD in (Lieberknecht, et al. 2011)). The Runnelstone reef drives an area of upwelling in the site that brings about enhanced productivity and high biodiversity.

³ The area is an important haul-out and pupping location for grey seals (SAD in (Lieberknecht, et al. 2011)).

Haliclystus auricula and *Palinurus elephas* have been recorded close to the boundaries of this rMCZ, and may also be present within it (SAD in (Lieberknecht, et al. 2011)).

This site has scientific value, having been previously studied by the National Oceanography Centre, and as an area of mobile species surveys by the Cornwall Wildlife Trusts.

Mobile species surveys in the area have provided evidence of the importance of the Land's End rMCZ as a feeding area to cetaceans and seabirds.

This rMCZ intersects with an area of higher than average benthic species diversity (within the south-west context) (SAD in (Lieberknecht, et al. 2011)).

The site is important for meeting regional connectivity.

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 5a. Fish and shellfish for human consumption		rMCZ Land's End
Baseline	Beneficial impact under Policy Option 1	
<p>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). Crawfish <i>Palinurus elephas</i> 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.</p> <p>Potting is the main fishing gear used in the rMCZ, targeting rocky areas. Some netting, primarily wreck netting and bass netting also occurs. Estimated value of UK vessel landings: £0.028m/yr.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Land's End
Baseline	Beneficial impact under Policy Option 1	

Table 5b. Recreation		rMCZ Land's End
<p>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.</p> <p>Several companies in the area provide charter boats that can take anglers to Land's End grounds. Species caught include pollack and haddock. It has not been possible to estimate the value of angling at the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>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.</p> <p>There are businesses that offer chartered trips to some of the best dive sites across Cornwall, including the Runnelstone reef and Logan's gulley, to experience reefs and wrecks. It has not been possible to estimate the value of diving in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to diving are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>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.</p> <p>Local companies provide boat trips for wildlife watching around Cornwall that</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Table 5b. Recreation		rMCZ Land's End
pass Land's End. Visitors have the chance to see many species of sea birds as well as dolphins, harbour porpoise, basking shark and ocean sunfish. It has not been possible to estimate the value of wildlife watching in the rMCZ.	<p>caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).</p> <p>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.</p>	Confidence: Moderate

Table 5c. Research and education		rMCZ Land's End
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>Southampton, Plymouth and Exeter universities currently use the area around Land's End for educational purposes (Natural England, 2009). It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The RSPB Discovery Centre at Sennen allows visitors to watch marine wildlife (with help from information wardens). Southampton, Plymouth and Exeter universities currently use the area around Land's End for educational purposes (Natural England, 2009). It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	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).	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence:</p>

Table 5c. Research and education		rMCZ Land's End
		Moderate

Table 5d. Regulating services		rMCZ Land's End
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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).</p> <p>Natural hazard protection: The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ Land's End
Baseline	Beneficial impact under Policy Option 1	

Table 5e. Non-use and option values		rMCZ Land's End
<p>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.</p>	<p>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.</p> <p>Examples of these values are shown in Ranger and others (2012). The most common reasons provided by voters in the Marine Conservation Society 'Your Seas Your Voice' campaign, for wanting to protect areas within the rMCZ, were for megafauna, including whales, cetaceans, sharks and dolphins, and the spectacular scenery above and below the sea ('This is a stunning area of natural underwater beauty'). Bequest values and a desire for recovery were also mentioned ('Amazing marine biodiversity here – I want it protected for my children's children'; 'The Runnelstone deserves complete protection. Its unique position and the richness of its marine wildlife mean that with protection it could flourish into a spectacular example of what our coastal waters could be like').</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area Lundy

Site area (km²): 3.7

Table 1. Conservation impacts				rMCZ Reference Area Lundy
1a. Ecological description				
<p>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.</p> <p>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 <i>Halichoerus grypus</i> is present on the island.</p> <p>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 <i>Parerythropodium coralloides</i>, sea-fan <i>Eunicella verrucosa</i> and erect branching sponges are present, as are all five British species of cup coral.</p> <p>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 <i>Carpomitra costata</i>, red sea-fingers <i>Alcyonium glomeratum</i>, the anemones <i>Parazoanthus axinellae</i> and <i>Aiptasia mutabilis</i> and the southern species of cup coral <i>Leptopsammia pruvoti</i>.</p> <p>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 <i>Laminaria ochroleuca</i> 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 <i>Molgula oculata</i> and the brown seaweed <i>Choristocarpus tenellus</i>.</p> <p>Seahorses <i>Hippocampus hippocampus</i> and <i>Hippocampus guttulatus</i>, crawfish <i>Palinurus elephas</i>, <i>Phymatolithon calcareum</i>, <i>Leptopsammia pruvoti</i> and <i>Eunicella verrucosa</i> 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 <i>Puffinus puffinus</i> breed (RSPB, pers. comm., 2012).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
Broad-scale Habitats				

Annex 12. Impact Assessment materials (Finding Sanctuary).

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
<i>Habitats of Conservation Importance</i>				
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
<i>Species of Conservation Importance</i>				
<i>Amphianthus dohrnii</i>	-	1	Unfavourable Condition	Recover to Reference Condition
<i>Leptopsammia pruvoti</i>	-	12	Unfavourable Condition	Recover to Reference Condition
<i>Phymatolithon calcareum</i>	-	1	Unfavourable Condition	Recover to Reference Condition
<i>Eunicella verrucosa</i>	-	37	Unfavourable Condition	Recover to Reference Condition
<i>Palinurus elephas</i>	-	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 under Policy Option 1		
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 under Policy Option 1	
Numerous archaeological features are recorded in the site including the Gull	An extra cost would be incurred in the assessment of environmental impacts made in	

Table 2a. Archaeological heritage	rMCZ Reference Area Lundy
<p>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).</p>	<p>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'.</p>

Table 2b. Renewable energy	rMCZ Reference Area Lundy				
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>Management scenario 1: Installation of devices 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).</p>					
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1				
<p>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 5km² (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 Group renewable energy representative, pers. comm., 2011). The areas of significant tidal stream resource are identified as being to the south and north</p>	<p>Tidal energy: The estimated cost to tidal energy developers of this rMCZ is estimated at:</p> <table border="1"> <tr> <td>£m (one-off cost)</td><td>Scenario 1</td></tr> <tr> <td>Cost to the operator</td><td>0.013</td></tr> </table> <p>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</p>	£m (one-off cost)	Scenario 1	Cost to the operator	0.013
£m (one-off cost)	Scenario 1				
Cost to the operator	0.013				

Table 2b. Renewable energy	rMCZ Reference Area Lundy
<p>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).</p>	<p>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.</p> <p>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.</p>

Table 2c. Recreation	rMCZ Reference Area Lundy
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>Recreational boating management scenario: Closure of the rMCZ to anchoring (except in emergency).</p> <p>Scuba diving/snorkelling management scenario: Closure of the rMCZ to anchoring of vessels (except in emergency) and use of shot lines.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>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).</p>	<p>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.</p>
<p>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</p>	<p>Shot lines are rarely used, and their prohibition is unlikely to significantly affect diving in the area (Lundy wardens, pers. comm., 2011).</p>

Table 2c. Recreation	rMCZ Reference Area Lundy
<p>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.</p>	<p>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.</p>

Table 2d. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Reference Area Lundy
<p>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).</p>	

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area Lundy
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Ports, harbours, shipping & disposal sites (excluding anchoring – see ‘recreation’); research and education.

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale¹⁵</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>			rMCZ Reference Area Lundy
ENG Feature	Representativity	Viability	
Moderate energy circalittoral rock	BSH	X	
Moderate energy infralittoral rock	BSH	X	
Subtidal coarse sediment	BSH	X	
Subtidal sand	BSH	X	
Fragile sponge and anthozoan communities on subtidal rocky habitats	FOCI Habitat	✓	
Mud habitats in deep water	FOCI Habitat	X	
Sea-fan anemone <i>Amphianthus dohrnii</i>	FOCI Species	✓	

¹⁵ copied from the JNCC and Natural England’s advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

Sunset cup coral <i>Leptopsammia pruvoti</i>	FOCI Species	✓	Recover to reference condition
Comomn maerl <i>Phymatolithon calcareum</i>	FOCI Species	✓	Recover to reference condition
Pink sea-fan <i>Eunicella verrucosa</i>	FOCI Species	X	Recover to reference condition
Spiny lobster <i>Palinurus elephas</i>	FOCI Species	X	Recover to reference condition
Site considerations			
Appropriate boundary	X		

Additional comments and site benefits:

¹ FOCI habitats Mud habitats in deep water, and FOCI species *Palinurus elephas* are at the minimum recommended number of three replicates. Mud habitats in particular have a very limited distribution within the SW with only two sites in rMCZs (one of which overlaps with a recommended reference area), plus one other in a recommended reference area.

² Viability for the BSH Mud habitats in deep water is dependent on a minimum criteria (5km²) which is only just under at this site (approx 7.5 x 4.5km but includes Lundy Island). However site is located within the SAC which does protect these features (reefs, seacaves and subtidal sandbanks), so is considered viable.

³ Viability for the FOCI species *Palinurus elephas* is dependent on patch diameter (5km) which is only just under at this site (approx 7.5 x 4.5km (but includes Lundy Island). However the site is located within the SAC which does offer protection to habitats which support these features, these features (reefs, seacaves and subtidal sandbanks), so considered viable.

⁴ Lundy's unique geography contributes to the existence of a range of sheltered and wave exposed conditions which are also conducive for a wide variety of species to thrive.

⁵ Warm southern currents meet cooler northern waters creating ideal conditions for a diverse and thriving marine environment. The variety of different marine habitats is unusual for such a small area and attracts a wealth of marine creatures. Some species found around Lundy are currently at the northern most extent of their range.

⁷ MB102 data highlighted the waters around Lundy as a 'biotope richness hotspot'.

⁸ Basking shark sightings have been common in the waters around Lundy, but in recent years there has been a sharp decline in recorded sightings (Natural England local knowledge).

rRA 13: This site is critical to the achievement of replication guidelines for FOCI species *Amphianthus dohrnii*.

Amphianthus dohrnii, *Leptopsammia pruvoti*, *Eunicella verrucosa* and *Palinurus elephas* are all UK BAP species.

rRA 13: Fragile sponge and anthozoan communities on subtidal rocky habitats is a UK BAP habitat which is in decline, contains key species and is classed as a 'functional habitat'

This site offers protection to FOCI species *Palinurus elephas* which is not protected in any existing MPAs within the SW region, and there is evidence that *Palinurus elephas* is in unfavourable condition in all SW waters. *Palinurus elephas* has limited distribution in the whole MCZ area and the only proposed sites nationally all occur in the FS region.

The site has been well surveyed for over 60 years resulting in a unique understanding of Lundy's marine life and environment. Several long surveys are now established, and the data held by Natural England and others provides an excellent baseline to compliment future work. Due to the site's relatively low exposure to anthropogenic influences (and the existence of an established NTZ) the site is an important control site for surveys being carried out on similar habitats elsewhere.

Interpretation facilities and material well developed.

Lundy has a high profile for marine conservation, nationally and internationally. It is a flagship site for marine conservation in the UK.

Fragile sponge and anthozoan communities on subtidal rocky habitats: UK BAP habitat which is in decline, contains key species and is classed as a 'functional habitat'.

Amphianthus dohrnii (recommended reference area): Rare / limited distribution at MCZ and UK level. BAP species (BRIG (ed. Ant Maddock) 2008).

Leptopsammia pruvoti: Rare / Limited Distribution (BRIG (ed. Ant Maddock) 2008).

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 5a. Fish and shellfish for human consumption		rMCZ Reference Area Lundy
Baseline	Beneficial impact under Policy Option 1	
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	<p>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.</p> <p>Achievement of the conservation objectives may improve the contribution of</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Table 5a. Fish and shellfish for human consumption		rMCZ Reference Area Lundy
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.	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.	Confidence: Moderate

Table 5b. Recreation		rMCZ Reference Area Lundy
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>As the rMCZ overlaps the existing No Take Zone, no angling is currently permitted and therefore there is no on-site value of angling.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p> <p>The designation is not expected to result in an increase in the number of visits, due to anticipated restrictions on anchoring (see Table 2c).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Reference Area Lundy
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5c. Research and education		rMCZ Reference Area Lundy
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>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. 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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>

Table 5c. Research and education		rMCZ Reference Area Lundy
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>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.</p>	<p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Reference Area Lundy
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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 diverse (Fletcher and others, 2012).</p> <p>Natural hazard protection: The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>Improved habitat condition and a reduction in anthropogenic pressures may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Reference Area Lundy
Baseline	Beneficial impact under Policy Option 1	
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.	<p>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.</p> <p>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'.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area Lyme Bay

Site area (km²): 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. <i>Padina pavonica</i> and <i>Sabellaria alveolata</i> 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
<i>Broad-scale Habitats</i>				
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
<i>Habitats of Conservation Importance</i>				
<i>Sabellaria alveolata</i> reefs	-	1	Unfavourable Condition	Recover to Reference Condition
<i>Species of Conservation Importance</i>				
<i>Haliclystus auricula</i>	-	1	Unfavourable Condition	Recover to Reference Condition
<i>Padina pavonica</i>	-	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 under Policy Option 1 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 under Policy Option 1	
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 2b. Commercial fisheries		rMCZ Reference Area Lyme Bay										
Source of costs of the rMCZ under Policy Option 1												
Management scenario 1: Closure of entire rMCZ to all commercial fishing.												
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1										
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.												
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.		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>		£m/yr	Scenario 1	Value of landings affected	<0.001					
£m/yr	Scenario 1											
Value of landings affected	<0.001											
Total direct impact under Policy Option 1												
Total direct impact on UK commercial fishing under Policy Option 1		Estimated annual value of UK vessel landings and gross value added (GVA) affected: <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td><0.001</td><td><0.001</td></tr><tr><td>GVA affected</td><td><0.001</td><td><0.001</td></tr></table> <p>The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.</p>		£m/yr	Scenario 1	Best estimate	Value of landings affected	<0.001	<0.001	GVA affected	<0.001	<0.001
£m/yr	Scenario 1	Best estimate										
Value of landings affected	<0.001	<0.001										
GVA affected	<0.001	<0.001										
Impact on non-UK commercial fishing		None.										

Table 2c. Flood and coastal erosion risk management (coastal defence)		rMCZ Reference Area Lyme Bay
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
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 under Policy Option 1		
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 under Policy Option 1	

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
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>Recreational angling management scenario: Closure of the rMCZ to recreational angling.</p> <p>Archaeological heritage management scenario: Closure of the rMCZ to fossil (or other man-made and natural item) collection.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>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).</p>	<p>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.</p>
<p>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 take home with them (Lyme Regis Museum, pers. comm., 2011). The</p>	<p>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.</p>

Table 2e. Recreation	rMCZ Reference Area Lyme Bay
<p>majority of the loose fossils seem to be found outside the rMCZ, towards the east of Lyme Regis (Lyme Regis Museum, pers. comm., 2011).</p> <p>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).</p>	

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 under Policy Option 1 (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.	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale¹⁶</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in</p>	rMCZ Reference Area Lyme Bay
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¹⁶ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

the table, more detail is provided in the narrative.									
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A3.1 High energy infralittoral rock	BSH	✓	✓	X	ENG viability not met. Site less than 5km diameter.	Recover to Reference Condition			
A5.4 Subtidal mixed sediments	BSH	✓	✓	X	ENG viability not met. Site less than 5km diameter.	Recover to Reference Condition			
A2.1 Intertidal coarse sediment	BSH	✓	✓	X	ENG viability not met. Site less than 5km diameter.	Recover to Reference Condition			
Honeycomb worm <i>Sabellaria alveolata</i> reefs	FOCI Habitat	✓	✓	✓	None	Recover to Reference Condition			BAP

Stalked jellyfish <i>Haliclystus auricula</i>	FOCI Species	✓	✓	✓	None	Recover to Reference Condition		Feature is not protected within existing MPAs in the FS area.	BAP
Peacock's tail <i>Padina pavonica</i>	FOCI Species	✓	✓	✓	None	Recover to Reference Condition	This feature only has the minimum amount of replicates.	Feature is not protected within existing MPAs in the FS area.	
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				✓					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * ¹					
Overlaps with existing MPAs				✓ * ²					

Additional comments and site benefits:

- Inclusion of this site makes a valuable contribution to meeting the replication target for *Padina pavonica* in the FS area.
- This site aims to protect *Haliclystus auricula* and *Padina pavonica* which are not protected elsewhere in the existing MPA network in the FS area.
- This site is regularly used in the MarClim surveys which specifically focus on species indicators of climate change and therefore has high scientific value.
- ¹Due to the fact that this recommended reference area is encompassed within the Lyme Bay and Torbay cSAC it has an increased likelihood of achieving its conservation objectives of recovering to reference condition.
- ²The site is located adjacent to the Undercliffs at Lyme Regis, an area of historic coastal landslides that has been protected within a coastal (terrestrial) SAC. The intertidal area of the recommended reference area is also designated as a Geological Conservation Review (GCR) site for its geology interest.

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 5a. Fish and shellfish for human consumption		rMCZ Reference Area Lyme Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Reference Area Lyme Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Low</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	N/A	N/A
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5c. Research and education	rMCZ Reference Area Lyme Bay
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Table 5c. Research and education		rMCZ Reference Area Lyme Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>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 the rMCZ is not known. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>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.</p>	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).	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Reference Area Lyme Bay
Baseline	Beneficial impact under Policy Option 1	
<p>Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2012).</p> <p>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).</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>Improved habitat condition and a reduction in anthropogenic pressures increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5d. Regulating services		rMCZ Reference Area Lyme Bay
<p>Natural hazard protection: The features of the site, in particular the intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>		Confidence: Low

Table 5e. Non-use and option values		rMCZ Reference Area Lyme Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Morte Platform**Site area (km²): 22.45**

Table 1. Conservation Impacts				rMCZ: Morte Platform
1a. Ecological Description				
<p>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</p> <p>A range of features are present including <i>Sabellaria spinulosa</i> 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).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
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
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
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
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p> <p>Management scenario 1: No additional management.</p> <p>Management scenario 2: Zoned closure of areas of circalittoral rock (high and moderate energy) in the rMCZ to bottom trawls and dredges.</p> <p>Management scenario 3: Closure of entire rMCZ to bottom trawls and dredges.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	

Table 2b. Commercial fisheries		rMCZ Morte Platform																		
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.																				
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.		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>				£m/yr	Scenario 1	Scenario 2	Scenario 3	Value of landings affected	0	0.004	0.005							
£m/yr	Scenario 1	Scenario 2	Scenario 3																	
Value of landings affected	0	0.004	0.005																	
Total direct impact under Policy Option 1																				
Total direct impact on UK commercial fisheries under Policy Option 1		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>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.004</td><td>0.005</td><td>0.001</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.002</td><td>0.002</td><td><0.001</td></tr></table>				£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate	Value of landings affected	0.000	0.004	0.005	0.001	GVA affected	0.000	0.002	0.002	<0.001
£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate																
Value of landings affected	0.000	0.004	0.005	0.001																
GVA affected	0.000	0.002	0.002	<0.001																

Table 2b. Commercial fisheries	rMCZ Morte Platform
	The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.
<i>Impact on non-UK commercial fisheries</i>	None.

Table 2c. Renewable energy		rMCZ Morte Platform	
Source of costs of the rMCZ under Policy Option 1			
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 under Policy Option 1		
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).	Wind energy: The estimated cost to the wind energy developer of this rMCZ is expected to fall within the following range of scenarios:		
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 the 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).	£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		

	<p>additional days of consultancy time at £700/day (RWE, pers. comm., 2011)) in 2013.</p> <p>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.</p>
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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 under Policy Option 1 (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.	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale¹⁷</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>	rMCZ Morte Platform
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¹⁷ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A4.1 High energy circalittoral rock	BSH	✓	✓	✓	None	Maintain			
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓	None	Maintain			
A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Maintain	This BSH is currently only reaching the minimum adequacy target	Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				X					
Overlaps with existing MPAs				None					

Additional comments and sites benefits:

Annex I2. Impact Assessment materials (Finding Sanctuary).

Morte Platform contains a mix of biotopes that is rarely represented elsewhere in the UK, according to the NBN database (SAD in (Lieberknecht, et al. 2011)). This is primarily due to the high tidal flows, high sediment content within the water column, and the mosaic of sediment and rock ridges.

Morte Platform was described by (Mackie, et al. 2006) as having 'high species richness and abundance across the region'.

Only a small proportion (<1%) of BSHs subtidal coarse sediment and subtidal sand are currently protected within existing MPAs in the FS area. Therefore, MCZs are critical for the protection of these features BSHs subtidal coarse sediment and subtidal sand in this region.

Morte Platform is included in a comprehensive survey of the area by five research cruises (reported in (Mackie, et al. 2006) and more recently in 2010/11 by contractors working for RWE (Linnane 2011).

The site contains higher than average benthic diversity and habitat diversity with the regional context (Lieberknecht, et al. 2011).

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 5a. Fish and shellfish for human consumption		rMCZ Morte Platform
Baseline	Beneficial impact under Policy Option 1	
<p>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 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.</p> <p>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.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Morte Platform
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ Morte Platform
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>Ecological survey work has been undertaken in the area overlapping the rMCZ through the North Devon Biosphere Reserve.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ Morte Platform
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Table 5d. Regulating services		rMCZ Morte Platform
<p>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).</p> <p>Natural hazard protection: As the site is offshore, the features are unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>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).</p>	<p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ Morte Platform
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Mounts Bay

Site area (km²): 11.2

Table 1. Conservation impacts				rMCZ Mounts Bay
1a. Ecological description				
<p>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 <i>Gavia immer</i> and black-throated diver <i>Gavia arctica</i> (RSPB, pers. comm., 2012).</p> <p>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 <i>Corynactis viridis</i>. Seagrass beds are present in more sheltered areas.</p> <p>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 <i>Palmaria palmata</i> have been found in the site.</p> <p>Single specimens of <i>Arctica islandica</i> and <i>Paludinella littorina</i> 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).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
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

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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
<i>Habitats of Conservation Importance</i>				
Seagrass beds	0.01	-	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Arctica islandica</i>	-	2	Favourable condition	Maintained at favourable condition
<i>Gobius cobitis</i>	-	3	Favourable condition	Maintained at favourable condition
<i>Haliclystus auricula</i>	-	4	Favourable condition	Maintained at favourable condition
<i>Lucernariopsis campanulata</i>	-	1	Favourable condition	Maintained at favourable condition
<i>Lucernariopsis cruxmelitensis</i>	-	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 under Policy Option 1		
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 under Policy Option 1	
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 also recorded in the site. English Heritage has indicated that this site is likely	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 Mounts Bay
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).	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
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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).</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
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
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Table 2c. National defence		rMCZ Mounts Bay
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
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 under Policy Option 1			
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 under Policy Option 1	
<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 this site (Cefas, 2011). As such, it is assumed that no licence applications are	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.000	0.001*
	*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire		

Table 2d. Ports, harbours, shipping and disposal sites	rMCZ Mounts Bay
<p>likely to be made over the timeframe of the Impact Assessment (IA).</p> <p><u>Harbour development:</u> St Michael's Mount harbour is adjacent to the rMCZ. Ports within 5km include Mousehole, Newlyn and Penzance.</p>	<p>suite of sites.</p> <p>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 expected.</p> <p>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.</p> <p>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</p>

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 under Policy Option 1 (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 assumes 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).

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ¹⁸ ✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.									rMCZ Mounts Bay	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale	
A5.4 Subtidal mixed sediments	BSH	✓	✓	X	This site has not met the ENG target for	Maintain				

¹⁸ copied from the JNCC and Natural England's advice to Defra on rMCZs

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					viability.				
A5.2 Subtidal sand	BSH	✓	✓	X	This site has not met the ENG target for viability.	Maintain			
A3.1 High energy infralittoral rock	BSH	✓	✓	X	This site has not met the ENG target for viability.	Maintain			
A1.1 High energy intertidal rock	BSH	✓	✓	X	This site has not met the ENG target for viability.	Maintain			
A2.1 Intertidal coarse sediment	BSH	✓	✓	X	This site has not met the ENG target for viability.	Maintain			
A2.4 Intertidal mixed sediments	BSH	✓	✓	X	This site has not met the ENG target for viability.	Maintain			
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	X	This site has not met the ENG target for viability.	Maintain			
A1.2 Moderate energy intertidal rock	BSH	✓	✓	X	This site has not met the ENG target for viability.	Maintain			
Seagrass beds	FOCI Habitat	✓	✓	✓	None	Maintain		Limited distribution at MCZ and UK level.	Limited distribution at MCZ and UK level.

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									UK BAP Priority habitat. OSPAR List of Threatened and/or Declining Species and Habitats.
Ocean quahog <i>Arctica islandica</i>	FOCI Species	✓	✓	✓	None	Maintain		Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level
Giant goby <i>Gobius cobitis</i>	FOCI Species	✓	✓	✓	None	Maintain	This feature is not protected in any existing MPAs, and is not proposed in any MCZs outside of the south-west regional project area.	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.
Stalked jellyfish <i>Haliclystus auricula</i>	FOCI Species	✓	✓	✓	None.	Maintain			
Stalked jellyfish <i>Lucernariopsis campanulata</i>	FOCI Species	X	X	✓	One of only two replicates within region	Maintain	This feature is not protected in any existing MPAs within the SW region.	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.

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							This has not met ENG guidelines for replication, however the feature has a limited regional distribution. This site is critical to replication guidelines.		
Stalked jellyfish <i>Lucernariopsis cruxmelitensis</i>	FOCI Species	✓	✓	✓	None	Maintain	This feature is not protected in any existing MPAs within the SW region. This FOCI is currently only reaching the minimum replication target.	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.
Site considerations									
Connectivity				✓ *1					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * 2					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

- ¹ This site is important for connectivity of the Finding Sanctuary Regional Project Area.
- ² The site has been reported to offer important nursery functions; act as a sea trout foraging area; of importance to wintering diving birds; and to be of importance for basking sharks (SAD in (Lieberknecht, et al. 2011)).
- This site appears to be a key area for stalked jellyfish, with all three species being recorded in the site.
- The site intersects with an area of higher than average benthic species diversity (SAD in (Lieberknecht, et al. 2011)).
- Local Group feedback has indicated that this area is of importance for wintering diving birds (SAD in (Lieberknecht, et al. 2011)).
- The Spiny Seahorse, has also been reported to occupy the seahorse meadows in the region (SAD in (Lieberknecht, et al. 2011)).
- The site offers protection to features that are not included in any existing MPAs.

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 5a. Fish and shellfish for human consumption		rMCZ Mounts Bay
Baseline	Beneficial impact under Policy Option 1	
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	<p>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.</p> <p>No change in feature condition or harvesting of fish and shellfish is</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Table 5a. Fish and shellfish for human consumption		rMCZ Mounts Bay
<p>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.</p> <p>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.</p>	<p>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).</p>	<p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Mounts Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>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</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no</p>	<p>Anticipated direction of change:</p>

Table 5b. Recreation		rMCZ Mounts Bay
<p>be commensurate with that provided by the features of the site when in favourable condition.</p> <p>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.</p>	<p>benefits to diving are expected.</p> <p>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).</p> <p>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.</p>	<p>↔</p> <p>Confidence: Moderate</p>
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ Mounts Bay
Baseline	Beneficial impact under Policy Option 1	

Table 5c. Research and education		rMCZ Mounts Bay
<p>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.</p> <p>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.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>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.</p>	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).	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Mounts Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Rock habitats can support</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Mounts Bay
<p>particularly high biodiversity (Fletcher and others, 2012).</p> <p>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).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	necessary, mitigation would be introduced, with the associated costs and benefits).	

Table 5e. Non-use and option values		rMCZ Mounts Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p> <p>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'.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area Mouth of The Yealm

Site area (km²): 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 occurs 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
<i>Broad-scale Habitats</i>				
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
<i>Habitats of Conservation Importance</i>				
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 under Policy Option 1		
Recreational angling management scenario: closure of rMCZ to recreational angling.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
<p>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.</p> <p>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).</p>	<p>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).</p>	

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 under Policy Option 1 (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.	

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ¹⁹ ✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.								rMCZ Reference Area Mouth of The Yealm	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A1.1 High energy intertidal rock	BSH	✓	✓	X	Viability target not met	Recover reference condition to			
A2.1 Intertidal coarse sediment	BSH	✓	✓	X	Viability target not met	Recover reference condition to			
A1.2 Moderate energy intertidal	BSH	✓	✓	X	Viability target not met	Recover reference condition to			

¹⁹ copied from the JNCC and Natural England's advice to Defra on rMCZs

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rock									
Estuarine rocky habitats	FOCI Habitat	✓	X	X	Viability target not met, patch less than 0.5km minimum diameter	Recover to reference condition			BAP – in decline. Contains key species. Functional habitat.
Seagrass beds	FOCI Habitat	✓	X	X	Viability not met, patch less than 0.5km minimum diameter	Recover to reference condition			BAP and OSPAR
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * ¹					
Overlaps with existing MPAs				✓					

Additional comments and site benefits:

¹ The site provides an excellent example of rich rocky shore communities. Aesthetically it is relatively unspoilt; and is a valuable asset to the surrounding landscape.

Seagrass beds recently found just off the site in the subtidal area (Natural England local adviser pers comm).

- Due to the fact that this recommended reference area is encompassed within a wider, established MPA, it has an increased likelihood of achieving its conservation objectives of recovering to reference condition.

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 5a. Fish and shellfish for human consumption		rMCZ Reference Area Mouth of the Yealm
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known commercial fishing currently occurs in the rMCZ.</p>	<p>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.</p> <p>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.</p> <p>As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Reference Area Mouth of the Yealm
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Low</p>
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ Reference Area Mouth of the Yealm
	overall increase in UK wildlife watching visits and/or a redistribution of location preferences.

Table 5c. Research and education	rMCZ Reference Area Mouth of The Yealm	
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>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.</p>	<p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Reference Area Mouth of The Yealm
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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).</p> <p>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).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>Improved habitat condition and a reduction in anthropogenic pressures may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Reference Area Mouth of The Yealm
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values	rMCZ Reference Area Mouth of The Yealm
	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 (km²): 9.43

Table 1. Conservation impacts			rMCZ Newquay and The Gannel	
1a. Ecological description				
<p>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.</p> <p>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.</p> <p>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.</p> <p>Sediments, <i>Fucus vesiculosus</i>, <i>Nereis (Hediste) diversicolor</i> and <i>Scrobicularia plana</i> have been collected from the Gannel estuary; <i>Mytilus edulis</i>, <i>Mytilus galloprovincialis</i> 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).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
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

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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
<i>Species of Conservation Importance</i>				
<i>Euinella verrucosa</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Gobius cobitis</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Ostrea edulis</i>	-	2	Favourable Condition	Maintained at Favourable Condition
<i>Paludinella littorina</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Anguilla Anguilla</i>	-	-	To be determined	To be determined
SNCBs advise that the conservation objective for the European eel (<i>Anguilla anguilla</i>) be designated as “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 Newquay and The Gannel
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	

Table 2a. Archaeological heritage		rMCZ Newquay and The Gannel
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
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 (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. Flood and coastal erosion risk management (coastal defence)		rMCZ Newquay and The Gannel
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
The 0 to 20 year Shoreline Management Plan policies along the coastline of the rMCZ are for 'hold the line' at Fistril 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	

Table 2b. Flood and coastal erosion risk management (coastal defence)	rMCZ Newquay and The Gannel
	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. Ports, harbours, shipping and disposal sites		rMCZ Newquay and The Gannel	
Source of costs of the rMCZ under Policy Option 1			
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 under Policy Option 1		
<u>Harbour development:</u> Newquay Harbour is situated adjacent to the rMCZ boundary. There are no known plans for developments at either harbour.	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.000	<0.001*
	*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.		
	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		

Table 2c. Ports, harbours, shipping and disposal sites	rMCZ Newquay and The Gannel
	(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 under Policy Option 1					
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		Costs of impact of rMCZ on the sector under Policy Option 1			
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).		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	Best estimate
		Cost to the operator	0.016	At least 0.016	0.015
		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).			

Table 2d. Renewable energy	rMCZ Newquay and The Gannel
	<p>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.</p> <p>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.</p> <p>The impacts that are assessed in both scenarios are based on JNCC and Natural England's advice on the mitigation that could be required.</p>

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 under Policy Option 1 (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 assumes 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).

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale²⁰</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>									rMCZ Newquay and The Gannel
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Maintain	This BSH is currently only reaching the minimum adequacy target	Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
A5.3 Subtidal mud	BSH	✓	✓	✓	None	Maintain			

²⁰ copied from the JNCC and Natural England's advice to Defra on rMCZs

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A5.2 Subtidal sand	BSH	✓	✓	✓	None	Maintain		Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	✓	✓	None	Maintain		Important for connectivity relating to salt marsh along north coast of the SW peninsula	
A1.1 High energy intertidal rock	BSH	✓	✓	✓	None	Maintain			
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	✓	None	Maintain			
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓	None	Maintain			

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A1.3 Low energy intertidal rock	BSH	✓	✓	✓	None	Maintain			
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain			
Pink sea-fan <i>Eunicella verrucosa</i>	FOCI Species	✓	X	X * 2	None	Maintain		Important for connectivity relating to <i>Eunicella verrucosa</i> along north coast of the SW peninsula	
Giant goby <i>Gobius cobitis</i>	FOCI Species	✓	✓	✓	None	Maintain	Species only included within SW rMCZs. One of only four replicates for this species	Important for connectivity relating to <i>Gobius cobitis</i> around the SW peninsula	Only south -west sites are proposed for this species. No examples in other regions.
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓	None	Maintain			
Sea snail <i>Paludinella littorina</i>	FOCI Species	✓	✓	✓	None	Maintain	Predominantly represented in SW sites – only one replicate outside Finding Sanctuary area.		Predominantly represented in SW sites – only one replicate outside Finding Sanctuary area.

Annex I2. Impact Assessment materials (Finding Sanctuary).

European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	✓	N/A	None	Maintain/Recover	This feature is not protected in any existing MPAs within the SW region. This FOCI is currently only the minimum replication target	The eel is a UK BAP priority species and IUCN red data book listed.	The eel is a UK BAP priority species and IUCN red data book listed.
Site considerations									
Connectivity				✓ * 1					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * 3					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

¹ This site is particularly important for connectivity within the Finding Sanctuary regional project area.

² Not viable within MCZ size, but important for maintaining connectivity between reef areas along north coast of SW peninsula.

³ Site is highlighted as an area of high biodiversity for species richness by MB102 (ABPmer 2009a).

MCZs are critical for the protection of these features BSHs subtidal coarse sediment and subtidal sand in this region.

Anecdotal evidence suggests short-snouted seahorses *Hippocampus hippocampus* have been recorded in the area.

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 5a. Fish and shellfish for human consumption		rMCZ Newquay and The Gannel
Baseline	Beneficial impact under Policy Option 1	
<p>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 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.</p> <p>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.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Newquay and The Gannel
Baseline	Beneficial impact under Policy Option 1	

Table 5b. Recreation	rMCZ Newquay and The Gannel	
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to diving are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation	rMCZ Newquay and The Gannel	
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education	rMCZ Newquay and The Gannel	
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>

Table 5c. Research and education	rMCZ Newquay and The Gannel	
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>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.</p>	<p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services	rMCZ Newquay and The Gannel	
Baseline	Beneficial impact under Policy Option 1	
<p>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 <i>Spartina anglica</i>, which grows in intertidal mud. 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).</p> <p>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).</p> <p>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).</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Newquay and The Gannel
It has not been possible to estimate the value of regulating services in the site.		

Table 5e. Non-use and option values		rMCZ Newquay and The Gannel
Baseline	Beneficial impact under Policy Option 1	
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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ North of Lundy (Atlantic Array Area)**Site area (km²): 348.24**

- This site has been proposed for designation under Policy Option 1 only.

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 <i>Puffinus puffinus</i> , razorbill <i>Alca torda</i> , guillemot <i>Uria aalge</i> 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 under Policy Option 1		
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 under Policy Option 1	
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 under Policy Option 1	
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.	

Table 2b. Commercial fisheries		rMCZ North of Lundy (Atlantic Array Area)									
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.											
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1									
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.											
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.		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>		£m/yr	Scenario 1	Scenario 2	Scenario 3	Value of landings affected	<0.001	<0.001	<0.001
£m/yr	Scenario 1	Scenario 2	Scenario 3								
Value of landings affected	<0.001	<0.001	<0.001								

Table 2b. Commercial fisheries	rMCZ North of Lundy (Atlantic Array Area)
<p>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).</p> <p>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.</p> <p>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.</p> <p>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.</p>	<p>Scenario 1: No impacts are anticipated under this scenario.</p> <p>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.</p> <p>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).</p> <p>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.</p> <p>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 for the wind farm are taken forward as the potential costs of the rMCZ to the sector.</p>

Table 2b. Commercial fisheries		rMCZ North of Lundy (Atlantic Array Area)					
		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	
		Value of landings affected		0.000	0.019	0.138	
		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.					
Total direct impact under Policy Option 1							
Total direct impact on UK commercial fisheries under Policy Option 1		Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following ranges:					
		£m/yr		Scenario 1	Scenario 2	Scenario 3	Best estimate
		Value of landings affected		0.000	0.019	0.138	0.017
		GVA affected		0.000	0.008	0.058	0.007
		The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.					
Impact on non-UK commercial fisheries under Policy Option 1: 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		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					

Table 2b. Commercial fisheries	rMCZ North of Lundy (Atlantic Array Area)
<p>in the wider south-west region, including this rMCZ (Bass Normandie, pers. comm., 2011).</p> <p>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 other countries.</p> <p>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.</p>	<p>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.</p> <p>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 landings excluding any adjustments for the wind farm are taken forward as the potential costs of the rMCZ to the sector.</p>

Table 2c. Renewable energy	rMCZ North of Lundy (Atlantic Array Area)
<p>Source of costs of the rMCZ both Policy Option 1</p> <p>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).</p> <p>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).</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>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</p>	<p>The estimated cost to the wind energy developer of this rMCZ is expected to fall within the following range of scenarios:</p>

Table 2c. Renewable energy	rMCZ North of Lundy (Atlantic Array Area)			
<p>the rMCZ.</p> <p>The proposed wind farm was originally expected to cover approximately 492km², 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 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 Sanctuary 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).</p>	<i>£m (one-off cost)</i>	Scenario 1	Scenario 2	Best estimate
	Cost to the operator	0.006	At least 0.006	0.006
	<p>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 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.</p> <p>Scenario 2: In addition to those costs set out under scenario 1, under scenario 2 further costs could arise as a result of mitigation requiring 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.</p> <p>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:</p> <ul style="list-style-type: none"> • 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. 			

Table 2c. Renewable energy	rMCZ North of Lundy (Atlantic Array Area)
	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 under Policy Option 1 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 under Policy Option 1 (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),	

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ²¹	rMCZ North of Lundy (Atlantic)
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²¹ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

<p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>									Array area)
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓	None	Maintain			
A5.1 Subtidal coarse sediment	BSH	✓	✓ * 1	✓	None	Maintain	This BSH is currently only reaching the minimum adequacy target. This site is needed to meet the lower level target for this feature within the regional MCZ project area	Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Maintain		Only a small proportion (<1%) of this BSH is currently protected within existing MPAs	

Annex I2. Impact Assessment materials (Finding Sanctuary).

								in the FS area	
A5.4 Subtidal mixed sediments	BSH	✓	✓	✓	None	Maintain			
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				X					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

¹ Adequacy for subtidal coarse sediment is currently only reaching the minimum adequacy target. This site is needed to meet the lower level target for this feature within the regional MCZ project area.

Only a small proportion (<1%) of BSHs subtidal coarse sediment and subtidal sand area currently protected within existing MPAs in the FS area. Therefore, MCZs are critical for the protection of these features BSHs subtidal coarse sediment and subtidal sand in this region.

This site contains the largest area of this feature within the inshore area.

The site has been comprehensively surveyed by five research cruises (reported in (Mackie, et al. 2006) and more recently in 2010/11 by contractors working for RWE (Linnane 2011).

The site contains higher than average benthic diversity and habitat diversity with the regional context (SAD in (Lieberknecht, et al. 2011)).

The site includes an area of the South Outer Bristol Channel Sands described by (Mackie, et al. 2006) as having 'very rich fauna and many colonial epifaunal species'.

The site includes an area of Morte Platform described by (Mackie, et al. 2006) as having 'high species richness and abundance across the region'.

Co-location with an offshore windfarm is viewed by the SAP as potentially beneficial from a scientific point of view (Science Advisory Panel 2011a, Science Advisory Panel 2011b). The site has been highlighted as a possible ‘win-win’ on the basis that safety restrictions within a windfarm would in themselves protect the seafloor habitat. The developers of the Atlantic Array have made a statement to say they are supportive of the site (SAD in (Lieberknecht, et al. 2011)).

Recent research shows that the site is used by marine mammals throughout the year. During year-long monitoring, there was no single day where cetaceans were not recorded. It is also potentially an important feeding ground for grey seals that haul out at Lundy SAC (Linnane 2011).

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 5a. Fish and shellfish for human consumption		rMCZ North of Lundy (Atlantic Array Area)	
Baseline	Beneficial impact under Policy Option 1		
<p>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 provided is assumed to be commensurate with that provided by the features of the site when in favourable condition.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>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.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>	

Table 5b. Recreation			rMCZ North of Lundy (Atlantic Array Area)	
Baseline		Beneficial impact under Policy Option 1		
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.		N/A		N/A



Table 5c. Research and education		rMCZ North of Lundy (Atlantic Array Area)	
Baseline	Beneficial impact under Policy Option 1		
<p>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.</p> <p>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.</p>	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
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education. <p>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).</p>	Anticipated direction of change: 	Confidence: Low

Table 5d. Regulating services		rMCZ North of Lundy (Atlantic Array Area)
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012).</p> <p>Natural hazard protection: As the site is offshore, it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives are achieved, the features of the site will be maintained in favourable condition.</p> <p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ North of Lundy (Atlantic Array Area)
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ North-East of Haig Fras**Site area (km²): 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 under Policy Option 1		
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 under Policy Option 1				
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 2a. Commercial fisheries		rMCZ North-East of Haig Fras																						
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.	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>						£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	0.001	0.013								
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4																				
Value of landings affected	0.000	0.000	0.001	0.013																				
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 under Policy Option 1																								
Total direct impact on UK commercial fishing under Policy Option 1	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><td>Best estimate</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><td>0.003</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.009</td><td>0.009</td><td>0.014</td><td>0.001</td></tr></table>						£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate	Value of landings affected	0.000	0.020	0.022	0.034	0.003	GVA affected	0.000	0.009	0.009	0.014	0.001
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate																		
	Value of landings affected	0.000	0.020	0.022	0.034	0.003																		
GVA affected	0.000	0.009	0.009	0.014	0.001																			
The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.																								
Impact on non-UK commercial fishing under Policy Option 1: Non-UK		Scenario 1: No impacts are anticipated under Scenario 1.																						

Table 2a. Commercial fisheries	rMCZ North-East of Haig Fras
<p>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).</p> <p>Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.110m/yr; static gears: £0.000m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.</p>	<p>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.</p>

Table 2b. National defence	rMCZ North-East of Haig Fras
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>MOD is known to make use of the rMCZ for water column activities. The rMCZ is in an MOD danger and exercise area.</p>	<p>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).</p>

Table 2c. Other impacts under Policy Option 1 that are assessed for the suite of MCZs and not for this site alone	rMCZ North-East of Haig Fras
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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 under Policy Option 1 (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)	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale²²</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>								rMCZ North-East of Haig Fras	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional	Ecological Importance at wider scale

²² copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

					minimum guidelines			MCZ level	
A5.1 Subtidal coarse sediment	BSH	✓	✓ *1	✓	None	Recover	This BSH is currently only reaching the minimum adequacy target. This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project area	Only a small proportion of this BSH is currently protected within existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea Regional Sea
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Recover		Only a small proportion of this BSH is currently protected within existing MPAs	
A5.3 Subtidal mud	BSH	✓	✓	✓	None	Recover		Only a small proportion of this BSH is currently protected within existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea

Annex I2. Impact Assessment materials (Finding Sanctuary).

									Regional Sea
A5.4 Subtidal mixed sediments	BSH	✓	✓	✓	None	Recover			
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * ²					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

- ¹ The adequacy target for subtidal coarse sediment has only just been achieved within this regional MCZ project area.
- ² Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these).

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 5a. Fish and shellfish for human consumption		rMCZ North-East of Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>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.</p> <p>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-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ North-East of Haig Fras
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ North-East of Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out at the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ North-East of Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012).</p> <p>Natural hazard protection: As the site is offshore, it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>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.</p> <p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ North-East of Haig Fras
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ North-West of Jones Bank

Site area (km²): 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 under Policy Option 1	
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 2a. Commercial fisheries		rMCZ North-West of Jones Bank			
Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges.					
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1			
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.					
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.		Scenario 1: No impacts are anticipated under Scenario 1.			
Estimated value of UK bottom trawl landings from the rMCZ: £0.001m/yr.		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:			
		£m/yr	Scenario 1	Scenario 2	
		Value of landings affected	0.000	0.001	
Total direct impact under Policy Option 1					
Total direct impact on UK commercial fishing under Policy Option 1		Estimated annual value of UK vessel landings and gross value added (GVA) affected are expected to fall within the following range:			
		£m/yr	Scenario 1	Scenario 2	Best estimate
		Value of landings affected	0.000	0.001	<0.001
		GVA affected	0.000	0.000	0.000
		The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.			

Table 2a. Commercial fisheries	rMCZ North-West of Jones Bank
<p>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).</p> <p>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.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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 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.</p>

Table 2b. National defence	rMCZ North-West of Jones Bank
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
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 under Policy Option 1 that are assessed for the suite of MCZs and not for this site alone	rMCZ North-West of Jones Bank
<p>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).</p>	

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 under Policy Option 1 (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)	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale²³</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>									rMCZ North-West of Jones Bank
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.1 Subtidal coarse sediment	BSH	✓	✓ * 1	✓ * 2	None	Recover	This BSH is currently only reaching the minimum adequacy	Only a small proportion of this BSH is currently	Only a small proportion of this BSH is currently protected within

²³ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

							target.	protected within existing MPAs	existing MPAs in the Western Channel and Celtic Sea Regional Sea
A5.2 Subtidal sand	BSH								
A5.3 Subtidal mud	BSH	✓	✓	✓	None	Recover	Out of all of the rMCZs and existing MPAs, this site contributes the largest area of subtidal mud. This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project area	Only a small proportion of this BSH is currently protected within existing MPAs	Out of all of the rMCZs and existing MPAs, this site contributes the largest area of subtidal mud in the whole MCZ project area and the CP2 region 4. Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea Regional Sea
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				✓ * 3					
Appropriate boundary				✓					

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Areas of additional ecological importance	✓ * ⁴
Overlaps with existing MPAs	None

Additional comments and site benefits:

- ¹ The adequacy target for subtidal coarse sediment has only just been achieved within this regional MCZ project area.
- ² The site is viable for the features that are proposed for designation, however the patch of subtidal coarse sediment is very small.
- ³ Although not proposed for designation, in the south, the site contains ice-rafted sediment which was carried by floated ice and deposited when it melted. This was a key process of sediment transport during the Great Ice Age, when sea levels were very much lower.
- ⁴ Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these).

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 5a. Fish and shellfish for human consumption		rMCZ North-West of Jones Bank
Baseline	Beneficial impact under Policy Option 1	

Table 5a. Fish and shellfish for human consumption		rMCZ North-West of Jones Bank
<p>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).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>


Table 5b. Recreation		rMCZ North-West of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur at or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education	rMCZ North-West of Jones Bank
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Table 5c. Research and education		rMCZ North-West of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out at the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ North-West of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>Environmental resilience: The features of the site contribute to the resilience</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5d. Regulating services		rMCZ North-West of Jones Bank
and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats (Fletcher and others, 2012).		Confidence: Low
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.		

Table 5e. Non-use and option values		rMCZ North-West of Jones Bank
Baseline	Beneficial impact under Policy Option 1	
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 (km²): 0.11

Table 1. Conservation impacts					rMCZ Otter Estuary
1a. Ecological description					
<p>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.</p> <p>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 <i>Scrobicularia plana</i>, the ragworm <i>Nereis diversicolor</i> and the crustacean <i>Corophium volutator</i>. 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 <i>Numenius arquata</i> and lapwing <i>Vanellus vanellus</i>. 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).</p>					
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				
<i>Anguilla anguilla</i>	-	-	To be determined	To be determined
SNCBs advise that the conservation objective for the European eel (<i>Anguilla anguilla</i>) is designated as “Recover to Favourable Condition”.				

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 under Policy Option 1 (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 assumes 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).

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale²⁴	rMCZ Otter Estuary

²⁴ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.									
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.2 Subtidal sand	BSH	✓	✓	✓ * 1	None	Maintain		Only a small proportion of this feature is captured in existing MPAs.	
A3.1 High energy infralittoral rock	BSH	✓	✓	✓ * 1	None	Maintain			
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	N/A	✓ * 1	None	Maintain			BAP
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓ * 1	None	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	✓ * 1	None	Maintain			BAP and OSPAR

Annex I2. Impact Assessment materials (Finding Sanctuary).

European eel <i>Anguilla anguilla</i>	FOCI Mobile Species	✓	✓	N/A	None	Maintain/ Recover * ²			BAP and OSPAR
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * ³					
Overlaps with existing MPAs				✓					

Additional comments and site benefits:

¹ Although this rMCZ does not meet the minimum viable size for BSHs (5km minimum diameter) the entire estuary unit is contained within the rMCZ boundary. Therefore this rMCZ is believed to be viable for all BSHs (using Natural England expert judgement).

² No quantitative information is included for this mobile FOCI species in the FS tables as the GIS data was too coarse a resolution to be meaningful. However, the species has been included in the draft conservation objectives on the basis of evidence provided to the FS project by the EA. (SAD in (Lieberknecht, et al. 2011))

³ This is an estuary area with high productivity and an important function as a nursery area for mobile species.

1989 Salt marsh survey of GB (Burd 1989) states that the Otter has more salt marsh vegetation than any other site in Devon, and with the associated tidal mudflats, it provides an important feed and resting area for overwintering birds.

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 5a. Fish and shellfish for human consumption		rMCZ Otter Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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.</p> <p>Currently, no commercial fishing is thought to take place in the estuary.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Otter Estuary
Baseline	Beneficial impact under Policy Option 1	
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.	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>Designating the rMCZ will protect its features and the ecosystem services</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Table 5b. Recreation		rMCZ Otter Estuary
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.	<p>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).</p> <p>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.</p>	Confidence: Moderate

Table 5c. Research and education		rMCZ Otter Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>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.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>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.</p>	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).	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Otter Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 <i>Spartina anglica</i>, which grows in intertidal mud (Fletcher and others, 2012).</p> <p>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).</p> <p>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).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ Otter Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ Otter Estuary
	the future, from past degradation and the risk of future degradation.	

rMCZ Reference Area South Dorset**Site area (km²): 25.0**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts				rMCZ Reference Area South Dorset	
1a. Ecological description					
<p>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.</p> <p>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).</p>					
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 under Policy Option 1		
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 under Policy Option 1	
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 under Policy Option 1	
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.	
Management scenario 2: Closure of rMCZ to all commercial fishing.	

Table 2b. Commercial fisheries		rMCZ Reference Area South Dorset	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1		
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.			
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.	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:		
	£m/yr	Scenario 1	Scenario 2
	Value of landings affected	0.001	0.001
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.	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:		
	£m/yr	Scenario 1	Scenario 2
	Value of landings affected	0.002	0.002
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.	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:		
	£m/yr	Scenario 1	Scenario 2
	Value of landings affected	0.016	0.016
Total direct impact under Policy Option 1			

Table 2b. Commercial fisheries		rMCZ Reference Area South Dorset		
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	Best estimate
	Value of landings affected	0.019	0.019	0.005
	GVA affected	0.009	0.009	0.002
	The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.			
Impact on non-UK commercial fisheries under Policy Option 1: 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.		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.		

Table 2c. Recreation		rMCZ Reference Area South Dorset
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
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 under Policy Option 1						
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 under Policy Option 1					
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 any cables related to the installation will be sought that would pass through	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: <table><tr><td>£m (one-off cost)</td><td>Scenario 1</td></tr><tr><td>Cost to the operator</td><td>0.012</td></tr></table> The analysis assumes that the potential future tidal energy installation is planned within, or		£m (one-off cost)	Scenario 1	Cost to the operator	0.012
£m (one-off cost)	Scenario 1					
Cost to the operator	0.012					

Table 2d. Renewable energy	rMCZ Reference Area South Dorset
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).	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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area South Dorset
None.	

Contribution to Ecological Network Guidance

This rRA sits within an rMCZ. For information on how this reference area contributes towards the guidelines in the Ecological Network Guidance please see the information provided underneath FS rMCZ 16 South Dorset. This is also taken from Annex 5 in JNCC and Natural England's Advice on rMCZs.

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 under Policy Option 1	
<p>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.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 4b. Recreation		rMCZ Reference Area South Dorset
Baseline	Beneficial impact under Policy Option 1	
<p>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 in unfavourable condition (see Table 1b).</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>Recovery of habitats may have benefits for 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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>
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 under Policy Option 1	
<p>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.</p> <p>No known research activity is focused on the area of the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.	As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.	Anticipated direction of


Table 4c. Research and education		rMCZ Reference Area South Dorset
No known education activity is focused on the area of the rMCZ.	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).	change:  Confidence: Low



Table 4d. Regulating services		rMCZ Reference Area South Dorset
Baseline	Beneficial impact under Policy Option 1	
<p>Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2012).</p> <p>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).</p> <p>Natural hazard protection: As the site is offshore, its features are not thought to contribute to the delivery of this service.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved the features will be recovered to reference condition.</p> <p>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.</p>	<p>Anticipated direction of change:  Confidence: Low</p>

Table 4e. Non-use and option values		rMCZ Reference Area South Dorset
Baseline	Beneficial impact under Policy Option 1	

Table 4e. Non-use and option values	rMCZ Reference Area South Dorset	
<p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: Moderate</p>

rMCZ South of Celtic Deep**Site area (km²): 552.4**

- This site has been proposed for designation under both Policy Option 1.

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	
Subtidal coarse sediment, Subtidal sand, Subtidal mixed sediment					

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 under Policy Options 1		
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		

Table 2a. Commercial fisheries		rMCZ South of Celtic Deep				
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 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 under Policy Options 1				
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:				
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
		Value of landings affected	0	0.005	0.005	0.005
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 relatively moderate level 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				

Table 2a. Commercial fisheries		rMCZ South of Celtic Deep					
		range:					
			Scenario 1	Scenario 2	Scenario 3	Scenario 4	
		£m/yr					
		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 under Policy Options 1							
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:					
			Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate
		£m/yr					
		Value of landings affected	0.000	0.005	0.011	0.037	0.003
		GVA affected	0.000	0.002	0.005	0.016	0.001
		The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.					
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).		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					

Table 2a. Commercial fisheries	rMCZ South of Celtic Deep
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).	(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 under Policy Options 1 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 under Policy Options 1 (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)	

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ²⁵ ✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out	rMCZ South of Celtic Deep
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²⁵ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

rows indicate where we do not agree with a feature being proposed for designation. Recommended conservation objectives in <i>italics</i> indicate where we do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.									
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.1 Subtidal coarse sediment	BSH	✓	✓* ¹	✓	None	Recover	This BSH is currently only reaching the minimum adequacy target. This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project area	Only a small proportion of this feature is captured in existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea Regional Sea
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Recover		Only a small proportion of this feature is captured in existing MPAs	
A5.3 Subtidal mud	BSH								

Annex I2. Impact Assessment materials (Finding Sanctuary).

A5.4 Subtidal mixed sediments	BSH	✓	✓	✓	None	Recover			
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				✓ * ²					
Appropriate boundary				✓					
Areas of additional ecological importance				✓ * ³					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

¹ The adequacy target for subtidal coarse sediment has only just been achieved within this regional MCZ project area.

² There is a sharp-edged glacial sand feature within the site, although this is not a primary reason for the proposal for the site as an rMCZ.

³ Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these).

This rMCZ hosts a wide range of soft sediment broad-scale habitats from mud to coarse sediment habitats.

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 5a. Fish and shellfish for human consumption		rMCZ South of Celtic Deep
Baseline	Beneficial impact under Policy Options 1	
<p>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).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ South of Celtic Deep
Baseline	Beneficial impact under Policy Options 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ South of Celtic Deep
Baseline	Beneficial impact under Policy Options 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ South of Celtic Deep
Baseline	Beneficial impact under Policy Options 1	
<p>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).</p> <p>Environmental resilience: The features of the site contribute to the resilience</p>	<p>If the conservation objectives are achieved the features will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5d. Regulating services		rMCZ South of Celtic Deep
and continued regeneration of marine ecosystems. Subtidal sediments found in sheltered or deeper water are particularly diverse habitats (Fletcher and others, 2012).		Confidence: Low
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.		

Table 5e. Non-use and option values		rMCZ South of Celtic Deep
Baseline	Beneficial impact under Policy Options 1	
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 (km²): 25.0**

- This site has been proposed for designation under Policy Option 1 only.

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 under Policy Option 1	
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.	

Table 2a. Commercial fisheries		rMCZ South of Falmouth			
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.					
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 under Policy Option 1			
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.		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:			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
£m/yr					
Value of landings affected		0	0.002	0.002	0.002

Table 2a. Commercial fisheries		rMCZ South of Falmouth				
<p>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.</p> <p>Feedback from Cornwall IFCA states that this estimate may be an underestimate (Cornwall IFCA, pers. comm., 2012). However no alternative estimate is available.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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.</p> <p>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.</p> <p>Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:</p>					
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	
	£m/yr	0	0.003	0.003	0.003	

Table 2a. Commercial fisheries		rMCZ South of Falmouth			
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.	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:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Value of landings affected	0.000	0.000	0.003	0.017
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.					

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 under Policy Option 1					

Table 2a. Commercial fisheries		rMCZ South of Falmouth					
Total direct impact on UK commercial fisheries under Policy Option 1		Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:					
			Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate
		£m/yr					
		Value of landings affected	0.000	0.005	0.009	0.026	0.002
		GVA affected	0.000	0.002	0.004	0.012	0.001
		The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.					
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
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Table 2b. National defence		rMCZ South of Falmouth
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
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 under Policy Option 1 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 under Policy Option 1 (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),	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale²⁶</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>									rMCZ South of Falmouth
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommend ed conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓	None	Recover			

²⁶ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Recover			
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * 1					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

¹ This site is located in an area of seasonal frontal systems, which means the area has high productivity (ref. SAD).

This site is important for the connectivity of the network along the south Cornwall coast (local adviser knowledge).

This site is in the region of a 'Benthic Hot Spot'.

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 5a. Fish and shellfish for human consumption		rMCZ South of Falmouth
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>


Table 5a. Fish and shellfish for human consumption		rMCZ South of Falmouth
	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 5b. Recreation		rMCZ South of Falmouth
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ South of Falmouth
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>

Table 5c. Research and education		rMCZ South of Falmouth
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ South of Falmouth
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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).</p> <p>Natural hazard protection: As the site is offshore it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives are achieved the features will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ South of Falmouth
Baseline	Beneficial impact under Policy Option 1	
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.	<p>Anticipated direction of change:</p>  <p>Confidence: Moderate</p>

rMCZ South of Portland**Site area (km²): 17.5**

- This site has been proposed for designation under Policy Option 1 only,

Table 1. Conservation impacts				rMCZ South of Portland
1a. Ecological description				
<p>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 km²) 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).</p> <p>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)</p>				
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 under Policy Option 1		
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 under Policy Option 1	
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 under Policy Option 1 (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 assumes 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).

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale²⁷</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>								rMCZ South of Portland	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A4.1 High energy circalittoral rock	BSH	✓	✓	X	Viability target not met	Maintain			
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	X	Viability target not met	Maintain			

²⁷ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

A5.1 Subtidal coarse sediment	BSH	✓	✓	X	Viability target met not	Maintain	This BSH is currently only reaching the minimum adequacy target	
A5.4 Subtidal mixed sediments	BSH	✓	✓	X	Viability target met not	Maintain		
A5.2 Subtidal sand	BSH	✓	✓	X	Viability target met not	Maintain		Only a small proportion of this feature is captured in existing MPAs

Site considerations	
Connectivity	✓

Annex I2. *Impact Assessment materials (Finding Sanctuary).*

Geological/Geomorphological features of interest	Portland Deep * ¹
Appropriate boundary	X
Areas of Additional Ecological Importance	✓ * ²
Overlaps with existing MPAs	✓

Additional comments and site benefits:

¹The rMCZ covers 55% (8.72km²) of ENG-listed geological / geomorphological feature of interest, Portland Deep.

The rMCZ incorporates Portland Deep - one of 12 ENG-listed geological / geomorphological features of importance - and its unique area of seabed, characterised by canyons and strong tidal streams, which create a very specific sea-floor habitat not found anywhere else in the south-west (SAD in (Lieberknecht, et al. 2011), page 432).

² Local group feedback indicates this area is important for seabirds and cetaceans, and also mentions the presence of bream nests in the area (SAD in (Lieberknecht, et al. 2011), page 430).

This site has been mapped as an area of higher than average benthic species diversity within national data layers from contract MB102 (ABPmer 2009a)

There is scientific value in this site because this is a well-studied site with good data from a range of sources (SAD in (Lieberknecht, et al. 2011), page 438).

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 5a. Fish and shellfish for human consumption		rMCZ South of Portland
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>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.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation	rMCZ South of Portland
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Table 5b. Recreation		rMCZ South of Portland
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The Portland area, particularly Portland Bill, is a popular angling spot. Species include mullet, wrasse, bass, pollack, garfish and mackerel. Charter boats visit the area. It has not been possible to estimate the value of angling in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	N/A	N/A
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ South of Portland
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The rMCZ overlaps with a draft Special Area of Conservation, the Portland Deep geological feature and the Portland Race. Past and future research is anticipated as a result of the designation and geological feature.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The Portland Deep and Portland Race may form part of existing education resources, although no specific information could be found.</p>	<p>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.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ South of Portland
Baseline	Beneficial impact under Policy Option 1	
<p>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</p>	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.	<p>Anticipated direction of change:</p>



Table 5d. Regulating services		rMCZ South of Portland
<p>global cycling of many elements, including carbon and nitrogen (Fletcher and others, 2012).</p> <p>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).</p> <p>Natural hazard protection: As the site is offshore it is unlikely to contribute to natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>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).</p>	 <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ South of Portland
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p> <p>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'.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: Moderate</p>

rMCZ South of the Isles of Scilly**Site area (km²): 132.2**

- This site has been proposed for designation under Policy Option 1 only.

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 under Policy Option 1	
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.	

Table 2a. Commercial fisheries		rMCZ South of the Isles of Scilly							
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1							
<p>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.</p>									
<p>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.</p> <p>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.</p>		<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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.</p> <p>Estimated annual value of UK dredge landings affected is expected to fall within the following range:</p> <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></table>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.003
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.003							
<p>UK Bottom trawls: A large number of trawlers fish in and around the rMCZ.</p> <p>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</p>		<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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.</p>							

Table 2a. Commercial fisheries		rMCZ South of the Isles of Scilly											
<p>Exploration of the Sea [ICES] Rectangle 28E3). Vessels may fish in the area 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).</p> <p>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).</p> <p>Estimated value of UK bottom trawl landings from the rMCZ: £0.037m/yr.</p>	<p>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).</p> <p>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.</p> <p>Estimated annual value of landings by UK bottom trawls affected by the rMCZ is expected to fall within the following range:</p>												
	<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>	£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.064						
£m/yr	Scenario 1	Scenario 2											
Value of landings affected	0.000	0.064											
Total direct impact under Policy Option 1													
Total direct impact on UK commercial fishing	<p>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:</p>												
	<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.067</td><td>0.008</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.028</td><td>0.004</td></tr></table>	£m/yr	Scenario 1	Scenario 2	Best estimate	Value of landings affected	0.000	0.067	0.008	GVA affected	0.000	0.028	0.004
£m/yr	Scenario 1	Scenario 2	Best estimate										
Value of landings affected	0.000	0.067	0.008										
GVA affected	0.000	0.028	0.004										

Table 2a. Commercial fisheries	rMCZ South of the Isles of Scilly
	The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.
<p>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).</p> <p>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.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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.</p>

Table 2b. National defence	rMCZ South of the Isles of Scilly
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
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	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

Table 2b. National defence	rMCZ South of the Isles of Scilly
MOD exercise area.	rMCZ alone).

Table 2c. Renewable energy		rMCZ South of the Isles of Scilly			
Source of costs of the rMCZ under Policy Option 1					
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		Costs of impact of rMCZ on the sector under Policy Option 1			
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).		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	Best estimate
		Cost to the operator	0.012	At least 0.012	0.011
		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			

Table 2c. Renewable energy	rMCZ South of the Isles of Scilly
	<p>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.</p> <p>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.</p> <p>The impacts that are assessed in both scenarios are based on JNCC and Natural England's advice on the mitigation that could be required.</p>

Table 2d. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ South of the Isles of Scilly
<p>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).</p>	

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 under Policy Option 1 (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),	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale²⁸</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>									rMCZ South of the Isles of Scilly
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps shortfalls relation ENG minimum guidelines or in to	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.1 Subtidal coarse sediment	BSH	✓	✓ * 1	✓	None	Recover	The adequacy target for this feature has only just been achieved. This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ	Only a small proportion of this feature is captured in existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea

²⁸ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

							project area		Regional Sea
A5.2 Subtidal sand	BSH	✓	✓	✓ * 2	None	Recover		Only a small proportion of this feature is captured in existing MPAs	

Site considerations	
Connectivity	✓ * 3
Geological/Geomorphological features of interest	✓ * 4
Appropriate boundary	✓
Areas of additional ecological importance	✓ * 5
Overlaps with existing MPAs	None

Additional comments:

- ¹ The adequacy target for subtidal coarse sediment has only just been achieved.
- ² The site is viable for the features that are proposed for designation, however the patch of subtidal sand is very small.

- ³ The regional MCZ project stated that this site improves connectivity for sediment habitats (Lieberknecht, et al. 2011).
- ⁴ Although this rMCZ does not coincide with any of the geological or geomorphological features of interest listed in the ENG, and is not proposed for geomorphology directly, it does contain a sharp-edged sand patch showing transverse-bedform features.
- ⁵ Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on recommended rMCZs for more detail on these).

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 5a. Fish and shellfish for human consumption		rMCZ South of the Isles of Scilly
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>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.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Low</p>

Table 5a. Fish and shellfish for human consumption		rMCZ South of the Isles of Scilly
	significant positive impact on commercial stocks.	

Table 5b. Recreation		rMCZ South of the Isles of Scilly
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ South of the Isles of Scilly
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5c. Research and education		rMCZ South of the Isles of Scilly
		Confidence: High
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ South of the Isles of Scilly
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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).</p> <p>Natural hazard protection: As the site is offshore it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives are achieved the features will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ South of the Isles of Scilly
Baseline	Beneficial impact under Policy Option 1	
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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ South-East of Falmouth**Site area (km²): 25.0**

- This site has been proposed for designation under Policy Option 1 only.

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 under Policy Option 1		
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 under Policy Option 1	
Features of archaeological interest are recorded in the site (English Heritage,	An extra cost would be incurred in the assessment of environmental impact made in	

Table 2a. Archaeological heritage		rMCZ South-East of Falmouth
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
pers. comm., 2012).	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 South-East of Falmouth
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1
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).		

Table 2b. Commercial fisheries		rMCZ South-East of Falmouth						
Estimated total value of UK vessel landings from the rMCZ: £0.031m/yr.								
<p>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).</p> <p>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).</p> <p>Estimated value of UK dredge landings from the rMCZ: £0.003m/yr.</p> <p>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</p> <p>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.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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.</p> <p>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.</p> <p>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):</p> <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></table>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.003
£m/yr	Scenario 1	Scenario 2						
Value of landings affected	0.000	0.003						

Table 2b. Commercial fisheries		rMCZ South-East of Falmouth											
<p>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).</p> <p>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.</p> <p>Estimated value of UK bottom trawl landings from the rMCZ: £0.018m/yr.</p> <p>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.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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).</p> <p>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 effort into 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).</p> <p>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):</p>												
	<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>	£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.018						
	£m/yr	Scenario 1	Scenario 2										
	Value of landings affected	0.000	0.018										
Total direct impact under Policy Option 1													
<p>Total direct impact on UK commercial fishing</p>	<p>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:</p>												
<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.021</td><td>0.003</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.009</td><td>0.001</td></tr></table>	£m/yr	Scenario 1	Scenario 2	Best estimate	Value of landings affected	0.000	0.021	0.003	GVA affected	0.000	0.009	0.001	
£m/yr	Scenario 1	Scenario 2	Best estimate										
Value of landings affected	0.000	0.021	0.003										
GVA affected	0.000	0.009	0.001										

Table 2b. Commercial fisheries	rMCZ South-East of Falmouth
	<p>The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.</p>
<p>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).</p> <p>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.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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.</p>

Table 2c. National defence	rMCZ South-East of Falmouth
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>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.</p>	<p>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).</p>

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 under Policy Option 1 (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),	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale²⁹</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>									rMCZ South-East of Falmouth
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps shortfalls relation ENG minimum guidelines or in to	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.1 Subtidal	BSH	✓	✓ * 1	✓	None	Recover	This BSH is currently only	Only a small proportion of	Only a small proportion of

²⁹ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

coarse sediment							reaching the minimum adequacy target. This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project area	this feature is captured in existing MPAs	this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea Regional Sea
A5.2 Subtidal sand	BSH								

Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Areas of additional ecological importance	✓ * 2
Overlaps with existing MPAs	None

Additional comments:

¹ The adequacy target for subtidal coarse sediment has only just been achieved within this regional MCZ project area.

² Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these).

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 5a. Fish and shellfish for human consumption		rMCZ South-East of Falmouth
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>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.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5a. Fish and shellfish for human consumption		rMCZ South-East of Falmouth
	<p>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.</p> <p>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.</p>	

Table 5b. Recreation		rMCZ South-East of Falmouth
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ South-East of Falmouth
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>

Table 5c. Research and education		rMCZ South-East of Falmouth
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ South-East of Falmouth
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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).</p> <p>Natural hazard protection: As the site is offshore it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives are achieved the features will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ South-East of Falmouth
Baseline	Beneficial impact under Policy Option 1	
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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area South-East of Portland Bill**Site area (km²): 0.25**

- This site has been proposed for designation under Policy Option 1 only.

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
<i>Broad-scale Habitats</i>				
High energy circalittoral rock	0.25	-	Unfavourable Condition	Recover to Reference Condition
<i>Habitats of Conservation Importance</i>				
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
<i>Source of costs of the rMCZ under Policy Option 1</i>		
<i>Management scenario 1:</i> Closure of rMCZ to all commercial fishing.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	

Table 2a. Commercial fisheries	rMCZ Reference Area South-East of Portland Bill				
<p>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 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.</p>					
<p>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.</p> <p>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).</p> <p>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.</p> <p>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.</p>	<p>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).</p> <p>Estimated annual value of UK dredge landings affected:</p> <table border="1"> <tr> <th>£m/yr</th><th>Scenario 1</th></tr> <tr> <td>Value of landings affected</td><td>0.010</td></tr> </table> <p>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).</p>	£m/yr	Scenario 1	Value of landings affected	0.010
£m/yr	Scenario 1				
Value of landings affected	0.010				

Table 2a. Commercial fisheries		rMCZ Reference Area South-East of Portland Bill										
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.	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 colspan="2">Scenario 1</td></tr><tr><td>Value of landings affected</td><td colspan="2"><0.001</td></tr></table>			£m/yr	Scenario 1		Value of landings affected	<0.001				
£m/yr	Scenario 1											
Value of landings affected	<0.001											
Total direct impact under Policy Option 1												
Total direct impact on UK commercial fishing	Estimated annual value of UK vessel landings and gross value added (GVA) affected: <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.010</td><td>0.003</td></tr><tr><td>GVA affected</td><td>0.005</td><td>0.001</td></tr></table> <p>The best estimate is based on an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.</p>			£m/yr	Scenario 1	Best estimate	Value of landings affected	0.010	0.003	GVA affected	0.005	0.001
£m/yr	Scenario 1	Best estimate										
Value of landings affected	0.010	0.003										
GVA affected	0.005	0.001										
Impact on non-UK commercial fishing	None.											

Table 2b. Recreation		rMCZ Reference Area South-East of Portland Bill
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
Angling: The area off Portland Bill, which includes the pMCZ is a popular site	The rMCZ is relatively small but it is within a popular fishing area and angling trips and	

Table 2b. Recreation		rMCZ Reference Area South-East of Portland Bill
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
<p>for catching bream, cod, mackerel, bull huss, undulate ray, bass, conger eel, plaice and pouting (Weymouth & Portland Licensed Skippers Association, 2011).</p> <p>A number of local angling charter boats (between 20 and 30 boats depending 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).</p> <p>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).</p>	<p>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, 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).</p>	

Table 2c. Renewable energy		rMCZ Reference Area South-East of Portland Bill
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
Tidal energy: The rMCZ overlaps with the Portland tidal energy Potential	Tidal energy: The estimated cost to tidal energy developers of this rMCZ is expected to fall	

Table 2c. Renewable energy	rMCZ Reference Area South-East of Portland Bill				
<p>Development Area (PDA) (PMSS, 2010). Any installation could have a footprint within the PDA of 5km², 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 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).</p>	<p>within the following range of scenarios:</p> <table> <tr> <th>£m (one-off cost)</th><th>Scenario 1</th></tr> <tr> <td>Cost to the operator</td><td>At least 0.011</td></tr> </table> <p>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.</p> <p>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).</p> <p>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.</p>	£m (one-off cost)	Scenario 1	Cost to the operator	At least 0.011
£m (one-off cost)	Scenario 1				
Cost to the operator	At least 0.011				

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area South-East of Portland Bill
None.	

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale³⁰</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>								rMCZ Reference Area South-East of Portland Bill	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale

³⁰ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

A4.1 High energy circalittoral rock	BSH	✓	✓	X	None	Recover to reference condition			
Blue mussel <i>Mytilus edulis</i> beds	FOCI habitat	✓	X	X * ¹	None	Recover to reference condition	This FOCI is currently only reaching the minimum replication target		
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				X					
Areas of Additional Ecological Importance				✓					
Overlaps with existing MPAs				✓					

Additional comments and site benefits:

- ¹Viability for the FOCI habitat Blue mussel beds (*Mytilus edulis*) is dependent on the whole patch being included where it occurs in discrete locations. In this site, the whole known patch is not included, so is not considered viable. However, it should be noted that the whole bed is partly protected by the Studland to Portland possible Special Area of Conservation (pSAC), and is unique in its size, therefore protecting a proportion to recovery status would be of benefit to this very large mussel bed.
- Dog whelks *Nucella lapillus*, are found in this location that are twice the size of the usual intertidal specimens (Lieberknecht, Hooper, et al. 2011).

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 5a. Fish and shellfish for human consumption		rMCZ Reference Area South-East of Portland Bill
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>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.</p> <p>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 beds. As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Reference Area South-East of Portland Bill	
Baseline	Beneficial impact under Policy Option 1		
<p>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).</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Low</p>	
<p>Diving: Diving is not known to take place in the rMCZ</p>	N/A	N/A	
<p>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.</p> <p>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.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>	

Table 5c. Research and education		rMCZ Reference Area South-East of Portland Bill
Baseline	Beneficial impact under Policy Option 1	

Table 5c. Research and education		rMCZ Reference Area South-East of Portland Bill
<p>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.</p> <p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Reference Area South-East of Portland Bill
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>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</p>	<p>If the conservation objectives of the features are achieved the features will be recovered to reference condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence:</p>

Table 5d. Regulating services	rMCZ Reference Area South-East of Portland Bill
<p>and fauna, and rock habitats can support particularly high biodiversity (Fletcher and others, 2012).</p> <p>Natural hazard protection: As the site is offshore, its features are not thought to contribute to the delivery of this service.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>Low</p>

Table 5e. Non-use and option values	rMCZ Reference Area South-East of Portland Bill
Baseline	Beneficial impact under Policy Option 1
<p>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.</p>	<p>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.</p> <p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

rMCZ South-West Deeps (East)**Site area (km²): 5,808.61**

- This site has been proposed for designation under Policy Option 1 only.
- Based on SNCB advice, draft conservation objectives for one feature in this site has been changed from those established by the Regional Sea Projects. The impacts of this change on management and costs have not been reflected in this Impact Assessment

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) (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	1747.24	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	3934.32	-	Favourable Condition	Maintained at Favourable Condition
SNCBs advise that the appropriate conservation objective for subtidal sand is “Recover” instead of “Maintain”.				
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)
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p> <p>Management scenario 1: No additional management.</p> <p>Management scenario 2: Zoned closure of areas of deep-sea bed and sub-tidal coarse sediment in the rMCZ to bottom trawls and dredges.</p> <p>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.</p> <p>Management scenario 4: Closure of entire rMCZ to bottom trawls and dredges.</p> <p>Management scenario 5: Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, and hooks and lines.</p>		
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1
<p>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.</p>		
<p>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</p>		<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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</p>

Table 2a. Commercial fisheries	rMCZ South-West Deeps (East)																	
<p>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.</p> <p>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.</p>	<p>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.</p> <p>Scenarios 4 and 5: Based on the modelled value of landings data (MCZ Fisheries Model), 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.</p> <p>Estimated annual value of UK dredge landings affected is expected to fall within the following range:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td><td>Scenario 5</td></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>0.000</td></tr></table>						£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
£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													
<p>UK Bottom trawls: UK bottom trawl activity, by both beam trawls and otter trawls, occurs throughout the rMCZ.</p> <p>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.</p> <p>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</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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.</p> <p>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).</p> <p>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,</p>																	

Table 2a. Commercial fisheries		rMCZ South-West Deeps (East)					
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 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.	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 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:						
			Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
		£m/yr					
		Value of landings affected	0.000	0.049	0.049	0.090	0.090
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.	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:						
			Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
		£m/yr					
		Value of landings affected	0.000	0.000	0.000	0.000	0.003
		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.					

Table 2a. Commercial fisheries		rMCZ South-West Deeps (East)																										
<p>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.</p>		<p>Scenarios 1, 2 and 4: No impacts are anticipated under these scenarios.</p> <p>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.</p> <p>Estimated annual value of UK hook and line landings affected is expected to fall within the following range:</p>																										
		<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td><td>Scenario 5</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td><0.001</td><td>0.000</td><td>0.003</td></tr></table>						£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									
		£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																					
		<p>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.</p>																										
Total direct impact under Policy Option 1																												
<p>Total direct impact on UK commercial fishing</p>		<p>Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:</p>																										
		<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td><td>Scenario 5</td><td>Best estimate</td></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>0.095</td><td>0.012</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.020</td><td>0.021</td><td>0.038</td><td>0.040</td><td>0.005</td></tr></table>						£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Best estimate	Value of landings affected	0.000	0.049	0.049	0.090	0.095	0.012	GVA affected	0.000	0.020	0.021	0.038	0.040	0.005
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Best estimate																				
		Value of landings affected	0.000	0.049	0.049	0.090	0.095	0.012																				
		GVA affected	0.000	0.020	0.021	0.038	0.040	0.005																				
<p>The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and and assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be</p>																												

Table 2a. Commercial fisheries	rMCZ South-West Deeps (East)
	an under- or over-estimate for this site.
<p>Impact on non-UK commercial fishing: Non-UK vessels using bottom trawls/dredges, mid-water trawls and static gears fish within the rMCZ (Lee, 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).</p> <p>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.</p>	<p>Scenario 1: No impacts are anticipated under Scenario 1.</p> <p>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).</p> <p>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.</p>

Table 2b. National defence	rMCZ South-West Deeps (East)
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.</p>	

Table 2b. National defence		rMCZ South-West Deeps (East)
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
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 under Policy Option 1 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 under Policy Option 1 (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)	

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ³¹									rMCZ South-West Deeps (East)
✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.									
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.1 Subtidal coarse sediment	BSH	✓	✓ * 1	✓	None	Recover	<p>This BSH is currently only reaching the minimum adequacy target.</p> <p>Of all of the rMCZs and existing MPAs, this site contributes the largest area of subtidal coarse</p>	<p>Only a small proportion of this feature is captured in existing MPAs</p>	<p>Only a small proportion of this BSH is currently protected within existing MPAs in CP2 region 4. Out of all of the rMCZs and existing MPAs, this site contributes the largest area of subtidal coarse sediment in the Western Channel and</p>

³¹ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

							<p>sediment.</p> <p>This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project area.</p>		Celtic Sea regional sea.
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Maintain	<p>Of all of the rMCZs and existing MPAs, this site contributes the largest area of subtidal sand. This site makes a significant contribution towards the lower level target for this feature within the regional MCZ project area</p>	<p>Only a small proportion of this feature is captured in existing MPAs.</p>	<p>Out of all of the rMCZs and existing MPAs, this site contributes the largest area of subtidal sand in the CP2 region. Out of all of the rMCZs, this site contributes the largest area of subtidal sands in the whole MCZ project area</p>
A6 Deep-sea bed	BSH	✓ * 2	✓ * 3	✓	None	Recover		<p>This feature is not protected within existing</p>	<p>This feature is not protected within existing MPAs. This</p>

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								MPAs. This feature has limited distribution.	This feature has limited distribution in the whole MCZ project area. This rMCZ is one of only two examples of this habitat proposed for designation within the whole MCZ project area and the Western Channel and Celtic Sea regional sea
Site considerations									
Connectivity				✓ * 4					
Geological/Geomorphological features of interest				Marine process feature - Celtic Sea Relict Sandbanks * 5					
Appropriate boundary				✓					
Areas of additional ecological importance				✓ * 6					

Overlaps with existing MPAs	None
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Additional comments and site benefits:

¹ The adequacy target for subtidal coarse sediment has only just been achieved within this regional MCZ project area.

^{2,3,4} No replication or adequacy guidelines were set for the habitat deep-sea bed because it has a limited distribution. There are two replicates for this feature within this regional MCZ project area and this is what is required by the ENG for other broad-scale habitats. Connectivity is not applicable to EUNIS Level 2 broad-scale habitat deep-sea bed due to the limited distribution of these habitats in the whole MCZ project area.

⁵ This site has been proposed for its geological/geomorphological significance to provide protection for the Celtic Sea Relict Sandbanks, a marine process feature. These are the largest known features of their kind in the world. The enigmatic Celtic Banks are among the deepest and largest shelf sand ridges of their type. Further study into their geomorphology will help elucidate their nature and the timing of their origin.

⁶ Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these). This rMCZ overlaps with an area of high benthic species biodiversity (Langmead, et al. 2010). The south-west of this rMCZ overlaps with a seasonal thermal front (Ellis, et al. 2012).

The site depth ranges from 120m to over 1000m where the continental shelf breaks. On the continental shelf over half of the site is dominated by mega-ripples with a depth range between 120 and 180m. The far south-west of the site intersects with an area of continental shelf break. This site is only one of two rMCZs within the regional MCZ project area as well as the whole MCZ project area with a very large depth range (100–1000m).

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 5a. Fish and shellfish for human consumption		rMCZ South-West Deeps (East)
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ South West Deeps (East)
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ South-West Deeps (East)
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ South-West Deeps (East)
Baseline	Beneficial impact under Policy Option 1	
<p>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</p>	If the conservation objectives are achieved some of the features will be recovered to favourable condition. Others will be maintained in favourable condition.	<p>Anticipated direction of change:</p>


Table 5d. Regulating services		rMCZ South-West Deep (East)
<p>global cycling of many elements, including carbon and nitrogen. The deep-sea bed acts as an unrivalled reservoir for sequestration of CO₂. 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).</p> <p>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).</p> <p>Natural hazard protection: As the site is offshore it is unlikely to contribute to natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>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.</p> <p>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).</p>	 Confidence: Low


Table 5e. Non-use and option values		rMCZ South-West Deep (East)
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p>  Confidence: Moderate

Table 5e. Non-use and option values

rMCZ South-West Deep (East)

rMCZ Studland Bay

Site area (km²): 3.9

- This site has been proposed for designation under Policy Option 1 only.
- Based on SNCB advice, the conservation objective for one feature in this site has been changed from those established by the Regional Sea Projects. The impacts of this change on management and costs are not reflected in this Impact Assessment.

Table 1. Conservation impacts

rMCZ Studland Bay

1a. Ecological description

Studland Bay is sandy, shallow (dropping to 5 metres in depth 2km from the shore) and sheltered from the prevailing south-west winds, making it an ideal habitat for a dense seagrass bed of *Zostera marina*. The underlying sea bed is made of chalk, with a fairly settled sandy/muddy substrate where species such as the lugworm *Arenicola marina* and sand mason worm *Lanice conchilega* are abundant.

The *Zostera marina* seagrass beds cover between 50ha and 91ha. A fringe of shorter seagrass occurs all along the edge of Studland Bay, containing a mixture of seagrass and mobile algae (including *Ulva* spp. and various red algae). The seagrass beds occur up to a metre high in the middle of the bay. In the seagrass there are abundant snakelocks anemones *Anemonia viridis* which live in the sunlit canopy growing on top of the seagrass.

The seagrass beds are an important habitat for two species of seahorse, *Hippocampus hippocampus* and *Hippocampus guttulatus*, and the bay is the only known breeding location for both indigenous seahorse species in the UK. The site is considered to be of international importance for the long-snouted or spiny seahorse, *H. guttulatus*, with the largest known breeding population of the species in the UK. In addition, all six species of British pipefish breed and live in Studland Bay. Native oysters *Ostrea edulis* have been found on hard substrate (and within seagrass beds), on rocky areas and on old moorings within Studland Bay.

The recommended Marine Conservation Zone (rMCZ) is situated in an area classified as having a medium level of biotope diversity which 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, and is adjacent to two Site of Special Scientific Interest designations. It has additional ecological importance as a nursery area for undulate ray *Raja undulate*; numerous eggcasings and sightings of juvenile undulate ray have been recorded in the bay (Lieberknecht and others, 2011).

1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km ²)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Intertidal mud	0.11	-	Favourable Condition	Maintained at Favourable Condition

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Intertidal sand and muddy sand	0.03	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	3.74	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	0.05	-	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
Seagrass beds	0.91	6	Unfavourable Condition	Recover to Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Hippocampus hippocampus</i>	-	1	Unfavourable Condition	Recover to Favourable Condition
<i>Ostrea edulis</i>	-	4	Favourable Condition	Maintained at Favourable Condition
<i>Raja undulata</i>	-	-	Unfavourable Condition	Recover to Favourable Condition
Statutory Natural Conservation Bodies (SNCBs) advise that the conservation objective for the Undulate ray (<i>Raja undulata</i>) is changed from “Recover” to “Maintain”				

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

Table 2a. Archaeological heritage		rMCZ Studland Bay
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
Items of archaeological interest are recorded in the site, including the wreck of a Dutch craft from 1940. Historic shipwrecks designated under the Protection of Wrecks Act 1973 are also present (Swash Channel and the Studland Bay wreck) (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).	

Table 2b. Commercial fisheries	rMCZ Studland Bay
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Table 2b. Commercial fisheries		rMCZ Studland Bay			
Source of costs of the rMCZ under Policy Option 1					
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 sea grass beds in the rMCZ to dredges and bottom trawls.					
Management scenario 2: Closure of sea grass beds in the rMCZ to dredges, bottom trawls, pots and traps, nets, and hooks and lines.					
Management scenario 3: Closure of entire rMCZ to dredges, bottom trawls, pots and traps, nets, and hooks and lines.					
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1			
Overview: The rMCZ is situated inside the 6nm (nautical mile) limit and so is only fished by UK vessels. A low level of commercial fishing occurs within the rMCZ. This is primarily with pots and traps in the south-eastern corner of the rMCZ, which overlaps with the potting ground around Old Harry headland. There is a low level of fishing with other gears, although the rMCZ is not thought to cover known fishing grounds.					
Estimated total value of UK vessel landings from the rMCZ: £0.019m/yr.					
UK Dredges: Dredging is not known to occur within the rMCZ (Southern Inshore Fisheries and Conservation Authority [IFCA], pers. comm., 2011). However, the MCZ Fisheries Model indicates that a low level of landings is taken from within the rMCZ. It is assumed that this is from fishing in the eastern edge of the rMCZ, which is outside the areas of sea grass. Estimated value of UK dredge landings from the rMCZ: £0.006m/yr.		Scenario 1: No impacts are anticipated under this scenario.			
		Scenario 2: As no dredging is thought to occur in the areas of sea grass, no impacts are anticipated under this scenario.			
		Scenario 3: The number of vessels and frequency of dredging potentially affected are not known. However, the bulk of the area of the rMCZ is not thought to be a regular fishing ground.			
		Estimated annual value of UK dredge landings affected is expected to fall within the following range:			
		£m/yr	Scenario 1	Scenario 2	Scenario 3
		Value of landings affected	0.000	0.000	0.006

Table 2b. Commercial fisheries		rMCZ Studland Bay			
UK Bottom trawls: Trawling is not known to occur within the rMCZ (Southern IFCA, pers. comm., 2011). The MCZ Fisheries Model indicates a low level of landings from within the rMCZ. It is assumed that this is from fishing in the eastern edge of the rMCZ, which is outside the areas of sea grass. Estimated value of UK bottom trawl landings from the rMCZ: £0.002m/yr.	Scenario 1: No impacts are anticipated under this scenario.				
	Scenario 2: As no bottom trawling is thought to occur in the areas of sea grass, no impacts are anticipated under this scenario.				
	Scenario 3: The value of landings likely to be affected is quite low, and the rMCZ is not a known trawling ground. As such, no significant impacts are anticipated.				
	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	
	Value of landings affected	0.000	0.000	0.002	
	In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with bottom trawls 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.				
UK Pots and traps: Potting takes place in the south-eastern corner of the rMCZ, which overlaps with a potting ground that is focused on the headland at Old Harry. Potting is not thought to take place within the areas of sea grass (Southern IFCA, pers. comm., 2011). Estimated value of UK pot and trap landings from the rMCZ: £0.010m/yr.	Scenario 1: No impacts are anticipated under these scenarios.				
	Scenario 2: As no fishing with pots and traps is thought to occur in the areas of sea grass, no impacts are anticipated under this scenario.				
	Scenario 3: The rMCZ will reduce the area of potting ground available around the headland. .				
	Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	
	Value of landings affected	0.000	0.000	0.010	
	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				

Table 2b. Commercial fisheries		rMCZ Studland Bay																			
		the range, and is likely to be less restrictive than that required for other gears.																			
UK Hooks and lines: Fishing with hooks and lines takes place in the south-eastern corner of the rMCZ, off the headland at Old Harry. The rMCZ is not thought to cover a regular fishing ground and no fishing with hooks and lines is thought to take place within the areas of sea grass (Southern IFCA, pers. comm., 2011). Estimated value of UK hook and line landings from the rMCZ: £0.001m/yr		Scenario 1: No impacts are anticipated under this scenario.																			
		Scenario 2: As no fishing with hooks and lines is thought to occur in the areas of sea grass, no impacts are anticipated under this scenario.																			
		Scenario 3: The value of landings likely to be affected is quite low, and the rMCZ is not a regular ground. As such, no significant impacts are anticipated.																			
		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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.001</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Value of landings affected	0.000	0.000	0.001							
£m/yr	Scenario 1	Scenario 2	Scenario 3																		
Value of landings affected	0.000	0.000	0.001																		
		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 under Policy Option 1																					
Total direct impact on UK commercial fishing:		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>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.019</td><td>0.001</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.000</td><td>0.009</td><td>0.001</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate	Value of landings affected	0.000	0.000	0.019	0.001	GVA affected	0.000	0.000	0.009	0.001
£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate																	
Value of landings affected	0.000	0.000	0.019	0.001																	
GVA affected	0.000	0.000	0.009	0.001																	
		The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be																			

Table 2b. Commercial fisheries		rMCZ Studland Bay
	an under- or over-estimate for this site.	
Impact on non-UK commercial fishing:	None.	

Table 2c. National defence		rMCZ Studland Bay
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
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 2d. Ports, harbours, shipping and disposal sites		rMCZ Studland Bay
Source of costs of the rMCZ under Policy Option 1		
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 anticipated that no additional mitigation of impacts on features protected by the rMCZ 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). Additional mitigation of impacts on features protected by the rMCZ, relative to baseline provided in the baseline case, may be needed for future port developments. .		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	

Navigational Dredging: 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 dredged channel is within 1km of the rMCZ. No other dredging activities are within 5km of the rMCZ. Swanage Harbour is within 5km of the rMCZ.

Disposal Sites: Disposal-at-sea activities occur within 5km of the rMCZ, but not within 1km, at Bournemouth Beach (beach recharge), Brownsea disposal site (experimental 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.

£m/yr	Scenario 1	Scenario 2
Cost to the operator	0.002	0.038*

*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.

Scenario 1: Poole Harbour Commissioners operate under the dredging protocol and it is expected that their 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 (average of generic estimates by two environmental consultancies, pers. comm., 2011), recurring every 3 years from 2013 (Natural England, pers. comm., 2011).

Scenario 2:

Navigational dredging: costs of £0.007m/yr every 3 years will be incurred, as described under scenario 1.

Disposal sites: Under Scenario 2 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.

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.
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Table 2e. Recreation		rMCZ Studland Bay
Source of costs of the rMCZ under Policy Option 1		
<p>Recreational boating management scenario: Replacement of the existing 51 moorings with eco-moorings and deployment of a further 49 eco-moorings (total eco-mooring provision of 100); establishment of one or more no-anchor zones.</p> <p>The scenario detailed above is based on outputs from ongoing Studland Bay meetings being chaired by the Marine Management Organisation (MMO) and has been derived in consultation with the MMO and Royal Yachting Association (RYA). The scenario reflects a realistic mix of the potential management that is being discussed. The management scenario has been put together for the purposes of the Impact Assessment (IA) and may differ from the actual management put in place if the rMCZ is designated.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
<p>Recreational boating: Studland Bay is a very popular destination for recreational boaters. The bay has an attractive beach and is set against the Dorset Area of Outstanding Natural Beauty (AONB), as well as a limited tidal range and good ground conditions which make the bay accessible to a range of vessels. The bay provides shelter from south, south-west and north-west winds and is the only sheltered anchorage from south-westerly winds between Weymouth and The Needles (Marine Projects, 2011).</p> <p>The bay is used by short-stay day boats and short-stay and overnight-stay cruising vessels, and there are no charges for mooring (there are thought to be 51 existing moorings in the bay) or anchoring. The majority of visiting boats are local, coming from between Weymouth and west of the Isle of Wight (Marina Projects, 2011) and in particular from Poole. There are approximately 5,300 leisure vessels at Poole, and nearly 9,000 between Weymouth and west of the Isle of Wight (Marine Projects, 2011).</p> <p>At peak times, typically weekends during the summer months, between 150 and 210 boats were observed in the bay on 6 occasions in 2009 (Dorset</p>	<p>It is anticipated that mitigation of impacts of anchoring of recreational vessels on the areas of sea grass protected by the rMCZ could be provided by replacement of the existing moorings with eco-moorings (eco-moorings are thought to cause less damage to marine habitats than traditional moorings) and deployment of further eco-moorings in the areas of seagrass where vessels currently anchor, so that a total of 100 eco-moorings is provided; and the establishment of one or more additional no-anchor zones (the exact size, number and location of these zones is not yet known). This management scenario is based on ongoing local area management discussions chaired by the MMO, as well as outputs from the Finding Sanctuary Vulnerability Assessment.</p> <p>It is thought to be unlikely that an increase in the number of moorings and a reduction in the space available for anchoring provided in the bay would make any significant difference to the number of boaters visiting the bay (BORG, pers. comm., 2011; RYA, pers. comm., 2011; Marina Projects, 2011). It is expected that some visitors to the bay may welcome the opportunity to be able to take up an existing mooring rather than anchor, and this may actually result in an increase in visiting boat numbers, particularly for overnight stays because the moorings would be more secure (Marine Projects, 2011).</p>	

Table 2e. Recreation	rMCZ Studland Bay
<p>Wildlife Trust, 2009), although observations for 2011 show a reduced number with a maximum of 105 boats being observed at any one time (Boat Owners Response Group [BORG], pers. comm., 2011). When the weather is bad, there may be no boats, even during peak times.</p> <p>Anchoring of boats is concentrated in the south-west corner of the bay, where it is most sheltered. This overlaps with part of the area of sea grass in the bay. There is an existing voluntary no-anchor zone in the south-west corner of the bay, covering 0.01km² of the sea grass beds (approximately 1% of the mapped area of seagrass beds within the rMCZ).</p> <p>It is estimated that between 20% and 40% (BORG, pers. comm., 2011) of people who moor or anchor within the bay go ashore, and a large proportion of these visitors may use the Studland village shop, pub and/or café, providing important income to the local economy.</p>	<p>This is not the case for all boaters, however, and many may prefer to continue to anchor. There are concerns that a large increase in the number of moorings may be unsightly and reduce the aesthetic quality of the bay (BORG, pers. comm., 2011).</p> <p>It is expected that there would be a fee for use of a new eco-mooring by a visiting boat (Marina Projects, 2011). So long as it is still possible to anchor for free in parts of the bay and any charges for mooring to a buoy are reasonable, no reduction in overall numbers of visiting boats would be expected (BORG, pers. comm., 2011; RYA, pers. comm., 2011; Marina Projects, 2011). Based on the installation of 100 eco-moorings, the total cost to visiting boats paying for the use of moorings is estimated to total £0.090m/yr.</p> <p>Capital costs associated with the removal of the existing moorings and the installation of 100 eco-moorings are estimated to total £0.433m (Finding Sanctuary calculations based on Marina Projects (2011)). (See Annex N for the assumptions used in the calculations.) This one-off cost is assumed to occur in the first year after designation (2013).</p> <p>Operating costs, including maintenance of the eco-moorings and collection of mooring fees, are estimated to total £0.087m/yr (Finding Sanctuary calculations based on Marina Projects (2011)). (See Annex N for the assumptions used in the calculations.) Not all of these costs will be additional as some existing operating costs arise as a result of the existing moorings.</p> <p>The total cost of eco-moorings is taken to be the sum of the mooring fees and capital costs, plus any operating costs not covered by the mooring fees. The present value of the costs over the 20 year time period of the IA is £1.700m.</p> <p>The creation of no-anchor zones over areas of seagrass is expected to be compatible with the anchoring of boats in the bay because boaters generally prefer to avoid anchoring in areas of sea grass (BORG, pers. comm., 2011). The impact on visiting boaters will however depend on the location, size and number of zones. If no-anchor zones are designed so as to continue to allow adequate access to anchorages in the south of the bay, then no significant impacts to recreational boaters would be expected. However, the extent to which additional no-anchor zones could be provided in the bay is not clear. It was concluded in a recent mooring viability appraisal (Marina Projects, 2011) that there was adequate space in the bay to provide a dedicated eco-mooring zone for 200 boats, an</p>

Table 2e. Recreation	rMCZ Studland Bay
	<p>overflow anchorage area, and an expansion or re-design of the existing no-anchor zone. Despite this, it should be noted that, if adequate access to mooring or anchorage areas – specifically in the sheltered south-western corner of the bay – is not retained, then impacts may include the following (BORG, pers. comm., 2011):</p> <ul style="list-style-type: none"> - Reduced space between boats: anchoring boats may position themselves too close to other boats, causing potential risks to safety. - Displacement of anchoring boats out of the south-west corner of the bay: the northern part of the bay does not afford the same level of shelter, and as such is a less comfortable place to anchor and often an unsafe place for recreational boats at anchor. As a result, boaters displaced out of the south-western corner of the bay may no longer visit Studland Bay. As there are no recognised local alternative places to anchor, this would significantly impact on their leisure experience. It would be expected that a reduction in the number of boats visiting Studland Bay would have an impact on local businesses in Studland village. There may also be wider impacts on the Poole Harbour area if boaters chose to relocate their harbour moorings from Poole to elsewhere. - Displacement of vessels to anchorages further from shore: if boats are forced to anchor further from the shore, this may deter them from accessing the beach. This would be expected to impact on local businesses in Studland village. - Anchoring in an emergency: while anchoring within no-anchor zones would be permitted in an emergency (United Nations Convention on the Law of the Sea [UNCLOS], 1982), the presence of the no-anchor zone may still discourage a boater from dropping anchor. As a result, they may take more risks rather than anchor within a no-anchor zone, increasing risks to safety. <p>No discussion of the potential security and insurance issues associated with eco-moorings compared with conventional moorings is included here. It is assumed that eco-moorings would only be introduced if security and insurance concerns could be satisfactorily addressed. There is a risk that, if security and insurance issues could not be satisfactorily addressed, alternative management may be required in order to achieve the conservation</p>

Table 2e. Recreation	rMCZ Studland Bay
	objectives. If this management were more stringent, then the potential costs to the sector would increase.

Table 2f. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Studland Bay
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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Studland Bay
Oil and gas (existing activity); research and education; water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale³²</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>								rMCZ Studland Bay	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.4 Subtidal mixed sediments	BSH	✓	✓	✓ * 1	None	Maintain			
A5.2 Subtidal sand	BSH	✓	✓	✓ * 1	None	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	✓ * 1	None	Maintain			

³² copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓ * 1	None	Maintain			
Seagrass beds	FOCI Habitat	✓	✓	✓	None	Recover		This habitat is important for the supported species.	
Short-snouted seahorse <i>Hippocampus hippocampus</i>	FOCI Species	✓	✓	✓	None	Recover	This FOCI is currently only reaching the minimum replication target	Only minimum number of replicates met. One of three sites in the region.	
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓	None	Maintain			
Undulate ray <i>Raja undulata</i>	FOCI Mobile species	X	X	N/A	Minimum target for replicates not met.	Recover	Only site proposed for this feature within the region.	Only site proposed for this feature within the region.	Only three sites designated for this in entire network.

Annex I2. Impact Assessment materials (Finding Sanctuary).

Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓ * 2
Overlaps with existing MPAs	None

Additional comments and site benefits:

Although *Hippocampus guttulatus* is not listed as a FOCI at this site, as the regional project did not assess this information to include it, there are only two other rMCZs where it is identified so adding them as a FOCI to this site would bring the regional replication up to the minimum.

²Published data (Garrick-Maidment, et al. 2010), and other strong anecdotal evidence show that a second species of seahorse *Hippocampus guttulatus* is predominantly present in Studland Bay, although it is not listed as a FOCI species for this site. Long-term research by the Seahorse Trust has highlighted Studland Bay as the only known site for breeding of *Hippocampus guttulatus* (SAD in (Lieberknecht, et al. 2011)) in the UK. To note, this long term research project is the only one of its kind in the UK. Natural England advises Defra to consider including this species on the listing for this site.

Annex I2. Impact Assessment materials (Finding Sanctuary).

Studland Bay is an important area of seagrass for Dorset. It is one of two significantly large beds in Dorset and the only large bed in the east of Dorset, supporting a rich combination of marine biota not found in other habitats.

¹ Although this site does not meet ENG guidelines for viability, the entire seagrass bed is within the rMCZ boundary.

Anecdotal evidence to suggest there is natural gas seepages within the southern end of Studland Bay, a potential point of interest within the Bay. (pers comms.)

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 5a. Fish and shellfish for human consumption		rMCZ Studland Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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. Seagrass beds within the rMCZ provide important nursery areas for flatfish (JNCC, 2011) and as such the rMCZ is likely to help to support potential on-site and off-site fisheries. The baseline quantity/quality of service provided is assumed to be commensurate with that provided by the features of the site when in favourable and unfavourable condition. The seagrass beds are thought to be in unfavourable condition (see Table 1b).</p> <p>There is currently a relatively low on-site value derived from fish and shellfish services, principally through potting activity. The estimated total value of UK vessel landings from the rMCZ is £0.018m/yr, of which potting accounts for £0.010m/yr. It has not been possible to estimate the value of the off-site benefits that derive from the seagrass nursery area.</p>	<p>If the conservation objectives of the features are achieved, some of the features (including the seagrass beds) will be recovered to favourable condition. Others will be maintained in favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, the costs of which are set out in Table 2b.</p> <p>The recovery of the seagrass beds to favourable condition may improve their functioning as a nursery area, potentially benefiting fisheries exploited within and outside the rMCZ.</p> <p>It is unclear whether the scale of habitat (excluding seagrass) 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 crawfish, may improve as a result of improved habitat condition and reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ. Any on-site benefits will also depend on the extent of activity permitted in the rMCZ.</p> <p>The potential benefits described here do not include the negative impacts of the additional fisheries management on fish and shellfish provision and off-</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5a. Fish and shellfish for human consumption		rMCZ Studland Bay
	site impacts of displaced effort.	

Table 5b. Recreation		rMCZ Studland Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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 and tourism services. The seagrass beds provide important nursery areas for flatfish (JNCC, 2011) and as such are likely to help to support potential on-site and off-site fisheries (Fletcher and others, 2012). 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 favourable and unfavourable condition (see Table 1b).</p> <p>Angling occurs along much of the beach on the landward boundary of the rMCZ. No further information is available. It has not been possible to estimate the value of angling on-site or the proportion of the value derived from angling off-site that results from the seagrass nursery area.</p>	<p>If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition.</p> <p>The recovery of the seagrass beds to favourable condition may improve their functioning as a nursery area, potentially benefiting fisheries exploited within and outside the rMCZ (see Table 4a for further details).</p> <p>As no additional management of angling is expected, fishers will be able to benefit from any on-site and off-site beneficial effects. If the rMCZ results in an increase in the size and diversity of species caught then this is expected to increase the value derived by anglers.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>
<p>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 and unfavourable condition.</p> <p>SCUBA diving and snorkelling occur in Studland Bay, from boats and from the shore. The bay is a popular dive spot, with the principal attraction being the seagrass area and seahorses (both features are thought to be in unfavourable condition). It has not been possible to estimate the value of diving in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved some of the features, including the seagrass beds and seahorses, will be recovered to favourable condition. Others will be maintained in favourable condition.</p> <p>An improvement in the condition and/or coverage of the seagrass beds may increase habitat complexity, resulting in increased species richness and/or diversity (Fletcher and others, 2012). If the rMCZ results in more abundant seahorses and an increase in species richness and/or diversity, this is expected to increase the value of dive trips derived by divers in the site.</p> <p>Improved local diving may result in an increase in dive trips to the area, which may have beneficial effects on the local economy. This increase may</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Studland Bay
	represent a redistribution of location preferences, rather than an overall increase in UK diving.	
<p>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 and unfavourable condition</p> <p>Dorset Wildlife Trust, the National Trust and Studland Sea School have created a Kayak Wildlife Trail in Studland Bay so that people can view marine wildlife above and below the water (birds, seaweeds and seagrass, crabs and fish) (Dorset Wildlife Trust, 2012). Bird watching is popular, and the bay is particularly good for rarer grebes and divers in winter, although much of this activity is concentrated around the dunes and heath (outside the rMCZ). It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>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.</p> <p>An improvement in the condition and/or coverage of the seagrass beds may increase habitat complexity, resulting in increased species richness and/or diversity (Fletcher and others, 2012). This may increase the value of wildlife watching for the (probably) small number of people who view the subtidal environment directly, e.g. via the Kayak Wildlife Trail.</p> <p>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</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5c. Research and education		rMCZ Studland Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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</p> <p>Research activities are carried out within the rMCZ. Recent work has included research on seagrass and seahorses. Between 2004 and 2008 an average of 26 dives a year occurred at Studland Bay wreck site and monitoring of the site is carried out twice a year.</p> <p>It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>

Table 5c. Research and education		rMCZ Studland Bay
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The National Trust Studland Study Centre is located in Studland Village. The National Trust runs a number of education programmes around the bay. These include: ranger-led sessions for school children covering the management and conservation of sand dunes and the surrounding coastal geomorphology; guided walks and conservation sessions on topics including sand dunes and coastal path management; and the National Trust Guardianship scheme, which provides an opportunity for local primary school children to assist rangers with scientific research and conservation (Jurassic Coast, 2008).</p> <p>It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	<p>MCZ designation may provide an opportunity to expand the focus of education events into the marine environment.</p> <p>Designation may aid the development of additional local (to the rMCZ) education infrastructure (e.g. events and interpretation boards), from which visitors to the site would derive benefit.</p> <p>Non-visitors may benefit if the rMCZ contributes to external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Studland Bay
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012).</p> <p>Natural hazard protection: The features of the site, in particular the seagrass beds and intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Studland Bay
Baseline	Beneficial impact under Policy Option 1	
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.	<p>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.</p> <p>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 the undersea plants and animals, and to safeguard the local area from possible future impacts ('Let's protect these precious areas before it's too late and they're gone forever') and for future generations ('This area is truly beautiful. We love exploring this area with our daughter; we want it to stay beautiful for her'). The aesthetic value of the area was highlighted by a number of voters ('It is an amazing site of natural beauty') as well as an emotional attachment built up from previous visits to the area ('Studland is an area of much beauty and is close to my heart from childhood memories of family holidays').</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area Swanpool**Site area (km²): 0.064**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts				rMCZ Reference Area Swanpool	
1a. Ecological description					
Swanpool is a lagoon, fed by two freshwater streams and formed behind a sand and shingle bar on the coast at Falmouth. Swanpool has the only natural population in Britain of a species of bryozoan, the trembling sea mat <i>Victorella pavida</i> (Lieberknecht and others, 2011).					
Feature		Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Species of Conservation Importance</i>					
<i>Victorella pavida</i>		-	102	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 Swanpool
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
One record is held for a terrestrial archeological site (Falmouth Cemetery) that borders this rMCZ. Information is also held that relates to previous environmental coring work conducted within the lagoon. 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 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 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	

Table 2a. Archaeological heritage		rMCZ Reference Area Swanpool
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
	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. Recreation		rMCZ Reference Area Swanpool
Source of costs of the rMCZ under Policy Option 1		
Recreational angling management scenario: Closure of rMCZ to recreational angling.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
Angling: The rMCZ is not a popular angling location. Angling within the rMCZ is permitted under licence only, with 4 licences issued to individuals each year. The licences are generally reissued to the same individuals who have been fishing in Swanpool for many years. The anglers typically target mullet. The annual licences are purchased from the management body of Swanpool for £40 each (Swanpool Beach, pers. comm., 2011).	Four individuals will be affected by the closure of Swanpool for angling, and an annual income of £160 will be lost to the management body. There are no alternative sites that would offer the same angling experience to the anglers who would be affected, due to the unique nature of Swanpool, although alternative angling sites are available in the local area. Though it will not have a significant impact on the UK economy, the rMCZ Reference Area is expected to have a significant impact on the four anglers who currently fish in the site.	

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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area Swanpool
Recreation (model boating); research and education; water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale³³ ✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.									rMCZ Reference Area Swanpool
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	

³³ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

					guidelines				
Trembling sea mat <i>Victorella pavida</i>	FOCI Species	✓ * 1	✓	✓ * 2	Only replicate within national network	Recover reference condition	to This has not met ENG guidelines for replication, however, it cannot be met in this region as the feature is not present in any other locations.	This feature is only known to occur in one location in the MCZ project area.	This feature is only known to occur in one location in the MCZ project area.
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					

Areas of Additional Ecological Importance	None
Overlaps with existing MPAs	✓

Additional comments and site benefits:

¹ Replication: FOCI species *Victorella pavid*a has not met ENG replication measure, however it is not present in any other location so the target is met.

² The ENG states that the FOCI species *Victorella pavid*a (Trembling sea mat) is found in saline lagoons, and viability is dependent on the whole lagoon being included. In this location the whole lagoon is included, so is considered viable

This is the only recommended site (reference areas and MCZs), nationally, that is proposed for the trembling seamount (*Victorella pavid*a) and this is the only confirmed place in English waters where the FOCI species *Victorella pavid*a has been recorded.

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 5a. Fish and shellfish for human consumption		rMCZ Reference Area Swanpool
Baseline	Beneficial impact under Policy Option 1	

Table 5a. Fish and shellfish for human consumption		rMCZ Reference Area Swanpool
<p>There is no current evidence that the <i>Victorella pavid</i>a contributes to the delivery of fish and shellfish services (Fletcher and others, 2012).</p> <p>No commercial fishing currently takes place in the recommended Marine Conservation Zone (rMCZ).</p>	<p>If the conservation objective of the feature is achieved, it will be recovered to reference condition. There is no evidence that the feature contributes to the delivery of fish and shellfish services and no commercial fishing takes place in the rMCZ. No impacts on the provision of fish and shellfish for human consumption are anticipated.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Reference Area Swanpool
Baseline	Beneficial impact under Policy Option 1	
<p>Angling: There is no current evidence that the <i>Victorella pavid</i>a contributes to the delivery of fish and shellfish services (Fletcher and others, 2011).</p> <p>A description of on-site angling activity is set out in Table 2b. It has not been possible to estimate the value of angling in the site.</p>	<p>If the conservation objective of the feature is achieved, it will be recovered to reference condition. There is no evidence that the feature contributes to the delivery of fish and shellfish services (for angling). No angling will be permitted in the recommended Marine Conservation Zone (rMCZ). No benefits for anglers are anticipated.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Moderate</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	N/A	N/A


Table 5b. Recreation	rMCZ Reference Area Swanpool	
<p>Wildlife watching: There is no current evidence that the trampling sea mat <i>Victorella pavid</i>a contributes to the delivery of recreation and tourism services (Fletcher and others, 2011).</p> <p>Swanpool is rich in wildlife. Bird watchers can spot a variety of species here including mallard, coot and little grebe. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objective of the feature is achieved, it will be recovered to reference condition. There is no evidence that the feature contributes to the delivery of recreation and tourism services.</p> <p>Designating the rMCZ will protect its feature (trembling sea mat) and the ecosystem services that it provides 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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Moderate</p>



Table 5c. Research and education	rMCZ Reference Area Swanpool	
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>Research activities including ecological surveys have been carried out as part of the management of the Swanpool Local Nature Reserve (LNR). Future research objectives are included in the current management plan for the LNR (Rule, 2008). It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: High</p>

Table 5c. Research and education		rMCZ Reference Area Swanpool
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Education events and interpretation are provided by the Swanpool Management Forum. Under the existing Swanpool management plan, aims to improve education resources are set out (Rule, 2008). It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	<p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Reference Area Swanpool
Baseline	Beneficial impact under Policy Option 1	
<p>Regulation of pollution: There is no current evidence that <i>Victorella pavida</i> contributes to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2012).</p> <p>Environmental resilience: There is no current evidence that <i>Victorella pavida</i> contributes to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012).</p> <p>Natural hazard protection: There is no current evidence that <i>Victorella pavida</i> contributes to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services.</p>	<p>If the conservation objective of the feature is achieved it will be recovered to reference condition.</p> <p>It is not known whether the recommended Marine Conservation Zone (rMCZ) will result in an improvement in the delivery of regulating services.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Reference Area Swanpool
Baseline	Beneficial impact under Policy Option 1	

Table 5e. Non-use and option values	rMCZ Reference Area Swanpool	
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 feature 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 Taw Torridge Estuary**Site area (km²): 5.0**

- This site has been proposed for designation under Policy Option 1.

Table 1. Conservation impacts	rMCZ Taw Torridge Estuary
1a. Ecological description <p>The site consists of two spatially separate parts, the upper Taw Estuary and the upper Torridge Estuary. In the Taw, the site overlaps with the Taw Torridge Estuary Site of Special Scientific Interest (SSSI), and in the Torridge, the recommended Marine Conservation Zone (rMCZ) boundary starts where the SSSI ends (at the old bridge).</p> <p>The Taw Estuary drains an area of 1,211km² (Environment Agency, 2000) and forms, together with the Torridge Estuary, a twin estuarine system that discharges into the Bristol Channel. The estuary is macro-tidal (tidal range >4 metres). The rMCZ provides an important ecological function as a nursery area, in particular for sea bass.</p> <p>The estuaries of the Taw and Torridge rivers together with the sand dune systems at Braunton Burrows and Northam Burrows and the grazing marshes at Braunton, are all key habitats in the area supporting many key species. There are large areas of salt marsh around Yelland and Penhill which show typical zonation of saltmarsh vegetation. Braunton Burrows at the north of the estuary (outside the rMCZ) is one of the largest dune systems in Britain.</p> <p>The estuaries support a variety of soft and hard substrate-based aquatic estuarine communities, including rocky outcrops and sea walls with algal growths and mussel beds, and a reef of honeycomb worm <i>Sabellaria alveolata</i>. A large proportion of the estuary is intertidal flats and gravel beds, and it is sandy with areas of shingle towards the mouth at the foreshore. In the narrow Torridge the intertidal flats are predominantly mud and sand, while in the Taw there are extensive mudflats and sandbanks which support many marine worms and other invertebrates. Well mixed, the sands contain modern skeletal debris of consistent composition, which persists up to 18km landward</p>	

from the mouth of the Taw Estuary. Although primarily a molluscan sand, remains of barnacles, bryozoans, echinoids, foraminifera, sponge spicules, decapods and coralline algae are common (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
<i>Broad-scale Habitats</i>				
Coastal saltmarshes and saline reedbeds	0.08	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.14	-	Favourable Condition	Maintained at Favourable Condition
Low energy intertidal rock	0.02	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mud	0.68	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	< 0.01	-	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 Taw Torridge Estuary
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
Four wrecks and peat are 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.,	

Table 2a. Archaeological heritage	rMCZ Taw Torridge Estuary
	2011). No further impacts on activities related to archaeology are anticipated.

Table 2b. Flood and coastal erosion risk management (coastal defence)	rMCZ Taw Torridge Estuary
<p>Source of costs of the rMCZ under Policy Option 1</p> <p>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.)</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1
<p>The 0 to 20 year Shoreline Management Plan (SMP) policies in the estuary and along the edge of the rMCZ are to 'hold the line' at existing settlement frontages and harbours. These will be very local interventions in the overall scale of the two estuaries. It will not be necessary to artificially maintain a particular sedimentation regime in the estuary to hold the line at these places – only local engineering solutions will be necessary. Overall, the dominant response to coastal change will be to allow natural processes to evolve with minimal intervention (Environment Agency, pers. comm., 2012).</p> <p>Changes will be inevitable in sedimentation and erosion patterns as a result of the SMP policies, but these will remain in dynamic equilibrium as the estuary boundary slowly changes over time. rMCZ interest features are associated with relatively mobile sediments and it is expected that they will be able to respond naturally to these changes (Environment Agency, pers. comm., 2012).</p>	<p>Should deliberate breaches in tidal defences prove necessary in time, the short-term impact of these on sediments would be modelled and mitigation options developed as necessary. These options would be based around detailed siting and level settings for breaches and would not incur additional costs to mitigate impacts on MCZ features (Environment Agency, pers. comm., 2012).</p> <p>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.</p>

Table 2c. Ports, harbours, shipping and disposal sites	rMCZ Taw Torridge Estuary
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Table 2c. Ports, harbours, shipping and disposal sites		rMCZ Taw Torridge Estuary	
Source of costs of the rMCZ under Policy Option 1			
<p>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.</p> <p>Management scenario 2: Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to future 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.</p>			
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1		
<u>Harbour development:</u> Bideford Harbour and the Port of Appledore are both within 5km of the rMCZ. There are no known development plans at either harbour.	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.000	0.001*
	*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.		
	Scenario 1: No costs are anticipated under this scenario.		
	Scenario 2: <u>Harbour developments:</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 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 under Policy Option 1 and not for this site alone	rMCZ Taw Torridge Estuary
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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Taw Torridge Estuary
Cables (existing interconnectors and telecom cables); commercial fisheries (collection by hand); ports, harbours, shipping and disposal sites; recreation; research and education; water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ³⁴	rMCZ Taw Torridge Estuary
✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.	

³⁴ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A1.3 Low energy intertidal rock	BSH	✓	✓	✓ * 1	None	Maintain			
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓ * 1	None	Maintain			
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓ * 1	None	Maintain			
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	N/A	✓ * 1	None	Maintain	Out of all the rMCZs in the FS are, this site contributes the second largest area of coastal salt marshes and saline reedbeds		
A5.2 Subtidal sand	BSH	✓	✓	✓ * 1	None	Maintain		Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in	

Annex I2. Impact Assessment materials (Finding Sanctuary).

								the FS area	
A5.3 Subtidal mud	BSH	✓	✓	✓ * ¹	None	Maintain			
European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	✓	N/A	None	<i>Maintain / Recover</i>			BAP and OSPAR species
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				X					
Areas of Additional Ecological Importance				X					
Overlaps with existing MPAs				✓					

Additional comments and site benefits:

¹ Although this rMCZ does not meet the minimum viable size for BSHs in diameter (5km minimum), this is met in linear length. Due to the natural geographic boundary of the estuary it is therefore considered viable (using Natural England expert judgement).

Only a small proportion (<1%) of BSH subtidal sand is currently protected within existing MPAs in the FS area. Therefore, MCZs are critical for the protection of these features BSHs subtidal coarse sediment and subtidal sand in this region.

Anticipated benefits to ecosystem services

Annex I2. Impact Assessment materials (Finding Sanctuary).

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 derived from 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 5a. Fish and shellfish for human consumption		rMCZ Taw Torridge Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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.</p> <p>However, there is currently no known commercial fishing within the rMCZ and therefore no value derived from on-site fisheries. It has not been possible to estimate the value derived from off-site fisheries as a result of the nursery area function.</p>	<p>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.</p> <p>No change in on-site 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).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Taw Torridge Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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. 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</p>	<p>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.</p> <p>No change in on-site feature condition or harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p>

Table 5b. Recreation		rMCZ Taw Torridge Estuary
<p>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.</p> <p>The level of angling at this site is unknown. It has not been possible to estimate the value of angling at the site.</p>	<p>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).</p>	<p>Confidence: Moderate</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	N/A	N/A
<p>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.</p> <p>The estuary is home to curlews, golden plovers, lapwings, redshanks and oystercatchers. Bird hides, cycle paths, a visitor centre and walks are available at the estuary. Bats can be spotted on the Tarka Trail, which runs along the estuary. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ Taw Torridge Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The rMCZ is situated within North Devon's Biosphere Reserve, through which a variety of research activities are undertaken. The full extent of current</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5c. Research and education		rMCZ Taw Torridge Estuary
research activity carried out in the rMCZ is unknown. It has not been possible to estimate the value derived from research activities associated with the rMCZ.		Confidence: High
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The rMCZ is situated within North Devon's Biosphere Reserve, and is therefore linked into a number of UNESCO education programmes. Education resources for schools are provided as are on-line education tools (at www.northdevonbiosphere.org.uk). Education events with a specific marine and coastal theme are organised in and around the rMCZ by Coastwise North Devon. The area receives high numbers of visitors. It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	MCZ designation may provide an opportunity to expand the focus of education events into 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).	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Taw Torridge Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>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 (Fletcher and others, 2012).</p> <p>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 overall biodiversity (Fletcher and others, 2012).</p> <p>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).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ Taw Torridge Estuary
Baseline	Beneficial impact under Policy Option 1	
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.	<p>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.</p> <p>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 the area with the most common reasons being the spectacular nature of the site and its biodiversity.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area The Fal**Site area (km²): 0.72**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts	rMCZ Reference Area The Fal
1a. Ecological description	
The eastern boundary follows the mean high water mark and is located just north of St Mawes. It has a depth range from mean high water to 7–8 metres below chart datum. The site has particularly rich benthic habitat and species diversity, with two important Features of Conservation Importance habitats present (maerl beds and seagrass beds).	

The St Mawes Bank has the most extensive bed of unattached calcified seaweed (maerl) in England and Wales. Maerl beds attract many other species, particularly those sheltering among the branching interstices, for example the rare Couch's goby *Gobius couchii*. Two species of maerl have been identified, *Phymatolithon calcareum* and *Lithothamnium coralloides*. Inshore of the maerl bed, seagrass *Zostera marina* is present on the sandy substrata. At the bottom of the channel (around 34 metres), the bottom consists of broken shell and sand, with rocky outcrops (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
<i>Broad-scale Habitats</i>				
Subtidal coarse sediment	0.05	-	Unfavourable Condition	Recover to Reference Condition
Subtidal macrophyte-dominated sediment	0.26	-	Unfavourable Condition	Recover to Reference Condition
Subtidal sand	0.38	-	Unfavourable Condition	Recover to Reference Condition
Intertidal coarse sediment	< 0.01	-	Unfavourable Condition	Recover to Reference Condition
Low energy intertidal rock	0.02	-	Unfavourable Condition	Recover to Reference Condition
<i>Habitats of Conservation Importance</i>				
Maerl beds	0.24	11	Unfavourable Condition	Recover to Reference Condition
Seagrass beds	0.34	2	Unfavourable Condition	Recover to Reference Condition
<i>Species of Conservation Importance</i>				
<i>Lithothamnium coralloides</i>	-	5	Unfavourable Condition	Recover to Reference Condition
<i>Cruoria cruoriaeformis</i>	-	1	Unfavourable Condition	Recover to Reference Condition
<i>Ostrea edulis</i>	-	3	Unfavourable Condition	Recover to Reference Condition
<i>Gobius couchii</i>	-	1	Unfavourable Condition	Recover to Reference Condition
<i>Phymatolithon calcareum</i>	-	7	Unfavourable Condition	Recover to Reference Condition
<i>Grateloupia montagnei</i>	-	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 The Fal
Source of costs of the rMCZ under Policy Option 1	
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 under Policy Option 1
Features of archaeological interest and peat are 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 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 2b. Commercial fisheries		rMCZ Reference Area The Fal	
Source of costs of the rMCZ under Policy Option 1			
Management scenario 1: Closure of entire rMCZ to all commercial fishing.			
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1	
Overview: The rMCZ is located off the St Mawes Bank in the Carrick Roads area of the Fal Estuary. A number of commercial fishing restrictions are already in existence (listed in Annex E). Non-UK vessels are not permitted to fish in the rMCZ. Within the rMCZ there is potting along the St Mawes Bank, principally for velvet crab and prawns, and the southern end of the Fal Oyster Fishery which permits licensed vessels to dredge using traditional sailing or rowing vessels. Estimated total value of UK vessel landings from the rMCZ: £0.027m/yr.			
UK Dredges: The rMCZ is located in the south-eastern corner of the Fal Oyster Fishery, which extends north from a line drawn between Trefusis Point and St Mawes Castle (Defra, 2006). It is a regulated oyster fishery with annual licences provided to sailing or rowing vessels that use traditional methods unique to the fishery (Defra, 2006). The number of active vessels has declined since the 1980s, when a fleet of around 100 vessels was common. Recent years have seen a fleet of around		Scenario 1: The rMCZ is inside the designated oyster fishery but the rMCZ is not expected to impact significantly on the activity of traditional oyster dredgers as the area covered by the rMCZ site is not currently fished. Oyster abundance is very low within the rMCZ (Cefas, pers. comm., 2011).	
		£m/yr	Scenario 1
		Value of landings affected	Negligible

Table 2b. Commercial fisheries	rMCZ Reference Area The Fal				
<p>30 active vessels (Port of Truro, pers. comm., 2011), with 28 vessels employing 35 people identified in 2009 (Cornwall SFC, 2010). Fishing effort occurs during the winter months, outside the closed season which runs from 1 April to 31 October.</p> <p>Oyster surveys are carried out by Cefas within the fishery. Though Cefas used to monitor oyster abundance in the rMCZ area it no longer surveys the area as oysters are no longer present (Cefas, pers. comm., 2011). The level of fishing effort in the rMCZ has fallen accordingly. The bulk of fishing effort takes place further north, outside the rMCZ (Royal Haskoning, 2009).</p> <p>Estimated value of dredge landings from the rMCZ: negligible.</p>					
<p>UK Pots and traps: It is estimated that 8 vessels regularly fish within the rMCZ (St Mawes and District Fishermen's Association, pers. comm., 2011). All of the vessels are under 10 metres, with most being fished single-handed. As such, the majority of their fishing effort occurs within the estuary. This is particularly the case during the winter (St Mawes and District Fishermen's Association, pers. comm., 2011)</p> <p>There are 2 main fisheries that occur in the rMCZ: a velvet crab fishery over the St Mawes Bank and a prawn fishery on the edge of the channel (St Mawes and District Fishermen's Association, pers. comm., 2011). MCZ Fisheries Model data are not available for this rMCZ. An alternative estimate has been calculated for the prawn fishery, but it has not been possible to obtain information regarding the value of the crab fishery.</p> <p>The prawn fishery occurs along the edge of the Carrick Roads channel (St Mawes and District Fishermen's Association, pers. comm., 2011), and consists of three distinct prawn fishing grounds (Royal Haskoning, 2009), one of which is inside the rMCZ. The prawn fishery (all three grounds) provides UK vessel landings (based on information from 2004) of an estimated £0.050m/yr (Environment Agency, cited in Royal Haskoning (2009)). In the absence of more recent information, it is assumed that the volume of landings has remained constant over time, with an inflation-</p>	<p>Scenario 1: The rMCZ would remove a part of grounds of the Falmouth prawn and velvet crab fisheries, affecting approximately 8 vessels. The affected vessels are not expected to be able to increase effort elsewhere to compensate for this loss, because all known productive areas are thought to already have gear on them (St Mawes and District Fishermen's Association, pers. comm., 2011).</p> <p>It is estimated that the affected vessels would lose between 10% and 15% of their annual fishing income as a result of the rMCZ. It is expected that the impacts of this would be greatest in the winter season when fishing activity is more heavily focused within the estuary due to poor weather. The rMCZ is therefore expected to have a significant impact on the fishers' incomes and the viability of their businesses (St Mawes and District Fishermen's Association, pers. comm., 2011).</p> <p>Estimated annual value of UK pot and trap landings affected (prawn landings only; therefore figure will be an underestimate):</p> <table border="1"> <tr> <th>£m/yr</th><th>Scenario 1</th></tr> <tr> <td>Value of landings affected</td><td>0.027</td></tr> </table>	£m/yr	Scenario 1	Value of landings affected	0.027
£m/yr	Scenario 1				
Value of landings affected	0.027				

Table 2b. Commercial fisheries		rMCZ Reference Area The Fal										
<p>adjusted estimated value of £0.082m/yr (value adjusted based on a 65% increase between 2004 and 2010 in the price of prawns and shrimps landed into the UK [MMO, 2011a]).. (Survey work is currently being undertaken by Cornwall Inland Fisheries and Conservation Authority [IFCA] to establish a better understanding of the prawn fishery.)</p> <p>Based on an equal division of the total value of the fishery across the three grounds, and using the estimate of the value of landings of £0.082m/yr, landings from the one fishing ground within the rMCZ are estimated at £0.027m/yr.</p>												
<p>UK Collection by hand: Occasional commercial scallop diving from two vessels has historically taken place within the rMCZ (J. Ellis, pers. comm., 2011). However, current scallop stocks within the rMCZ are not thought to be sufficiently abundant to enable viable harvesting (Dive scallop skipper, pers. comm., 2012).</p> <p>MCZ Fisheries Model data are not available for this rMCZ and it has not been possible to calculate an alternative estimate of the value of landings.</p>		<p>The rMCZ would remove an area historically targeted by two commercial scallop divers. While the area of the rMCZ is not currently targeted, it is expected that it would be once scallop stocks have sufficiently recovered (Dive scallop skipper, pers. comm., 2012).</p>										
Total direct impact under Policy Option 1												
<p>Total direct impact on UK commercial fishing:</p>		<p>Estimated annual value of UK vessel landings (prawn landings using pots and traps only) and gross value added (GVA) affected:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.027</td><td>0.007</td></tr><tr><td>GVA affected</td><td>0.013</td><td>0.003</td></tr></table>		£m/yr	Scenario 1	Best estimate	Value of landings affected	0.027	0.007	GVA affected	0.013	0.003
£m/yr	Scenario 1	Best estimate										
Value of landings affected	0.027	0.007										
GVA affected	0.013	0.003										

Table 2b. Commercial fisheries		rMCZ Reference Area The Fal
	The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.	
Impact on non-UK commercial fishing:	None	

Table 2c. Ports, harbours, shipping and disposal sites		rMCZ Reference Area The Fal	
Source of costs of the rMCZ under Policy Option 1			
<p>Management scenario 1: Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to navigational dredging only. 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.</p> <p>Management scenario 2: Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to navigational dredging, 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. Additional mitigation requirements: re-location of Cross Roads buoy; and additional capital dredge mitigation. No 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.</p>			
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1	
There are a number of ports and harbours located in the Fal Estuary. The Port of Falmouth is the largest port in the area. It includes Falmouth Docks, the Inner Harbour, Carrick Roads Anchorage and Cross Roads Anchorage, and Falmouth Bay. The key activities provided by the port are ship repair, cargo handling, cruise ships, construction of superyachts, bunkering services, recreational boating and a number of other smaller business operations. Services to the marine renewable energy sector may be offered in the future (Tibbalds Planning and Urban Design, 2011). The rMCZ is located within the harbour limits, although none of the port infrastructure is situated within the rMCZ.	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	<0.001	1.237*
		*This estimate for additional cost in future licence applications for port developments arising as a result of this rMCZ is not used to estimate the total costs for the IA. It is based on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.	
		Scenario 1: When the licence application for the capital dredge is re-submitted, it is anticipated that the EIA that was previously conducted will need to be revised so that it	

<p>The Port of Truro is accessed by the main channel that runs adjacent to the rMCZ (Port of Truro, pers. comm., 2012). The port itself is more than 5km from the rMCZ. The harbours of Penryn and St Mawes are within 5km of the rMCZ</p> <p><u>Cross Roads buoy:</u> The Cross Roads Anchorage buoy is situated approximately 0.1km from the rMCZ. It provides one of four deep water berths for ships at the the Port of Falmouth. The buoy is used for bunkering during periods of bad weather, typically through the winter, and its provision is also a requirement of a contract between the port and the Royal Fleet Auxiliary (RFA) (Falmouth Harbour Commissioners, pers. comm., 2011). The RFA contract is for 5 years and expires in 2014 (Tibbalds Planning and Urban Design, 2011). For the purposes of this baseline it is assumed that the contract will be renewed after this period and retained over the timeframe of the Impact Assessment (IA). The buoy is also used as a mooring for distressed vessels (Falmouth Harbour Commissioners, pers. comm., 2011).</p> <p><u>Port masterplan and planned capital dredge:</u> In 2009, it was estimated (based on a detailed business survey) that businesses located at the Port of Falmouth directly employed 1,465 people (1,401 full time equivalent (FTE) jobs) and contributed approximately £75 million of gross value added (GVA) to the UK economy (Roger Tym and Partners, 2011). This represents 1% of the GVA of Cornwall and the Isles of Scilly.</p> <p>The port has recently finalised a master plan that will enable it to maintain and develop its services and remain competitive within the context of a changing market. A key component of the master plan is to allow larger vessels to access the port, as the average size of vessels is increasing. In order to remain competitive, particularly in the ship repair market, facilities at the port will need to provide access to larger ships (Tibbalds Planning and Urban Design, 2011). A capital dredge to deepen the main approach channel from a declared depth of 5.1 metres below Chart Datum to 8.1 metres is necessary to allow for this and is essential to the master plan (Tibbalds Planning and Urban Design, 2011). At its closest point, the proposed dredge is less than 1km from the rMCZ.</p>	<p>explicitly considers the potential impacts on the MCZ's features and their conservation objectives. For the purposes of the IA it is assumed that a new licence application and EIA will be submitted in 2013. The rMCZ is expected to result in an additional one-off cost of producing the revised EIA of approximately £0.007m (see Annex N for calculations).</p> <p>Scenario 2:</p> <p><u>Cross Roads buoy:</u> Use of the deep water berth of the Cross Roads buoy may disturb sediment, which could be (unintentionally) deposited within the rMCZ. (There is not currently enough evidence to conclude whether sediment deposition occurs or not.) Because it is not known whether unintentional impacts on the MCZ's features arise, this scenario assumes that use of the Cross Roads buoy causes unintentional disturbance of sediment that impacts on achieving the MCZ's features conservation objectives. This could be mitigated if the buoy was re-located (Natural England, pers. comm., 2011). However, there are no other available locations further from the rMCZ that could provide for vessels of up to 200 metres in length and with 15 metre draft (Falmouth Harbour Commissioners, pers. comm., 2011). Therefore it is assumed that the buoy would need to be removed, and the activity associated with it would no longer take place. This would include:</p> <ul style="list-style-type: none"> • bunkering in periods of bad weather. It is estimated that 75% of affected vessels would use bunkering services elsewhere, while 25% would wait for an improvement in the weather to allow other Port of Falmouth bunkering facilities to be used (Falmouth Harbour Commissioners, pers. comm., 2011); • the RFA contract would be lost as the Port of Falmouth would no longer have 4 deep water berths, which is a requirement of the contract (Falmouth Harbour Commissioners, pers. comm., 2011). <p>It is estimated that the combined impacts would result in an average loss in revenue from bunkering of £0.22m/yr and from the RFA contract of £5m/yr (Falmouth Harbour Commissioners, pers. comm., 2011). However, it should be noted that the costs could be significantly higher. For the financial year 2010/11 the RFA contract generated £27.2m of revenue to the port (Falmouth Harbour Commissioners [A&P Falmouth and Falmouth Harbour Commissioner Accounts], pers. comm., 2011).</p> <p>The resultant estimated gross direct impact of removal of Cross Roads Buoy on UK GVA is</p>
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<p>Through the implementation of the master plan direct employment at the port is expected to increase from 1,401 (FTE) in 2009 to 4,355 in 2030 and GVA/yr is expected to increase from £75m to £233.3m over the same period (Roger Tym and Partners, 2011). Successful implementation of the master plan is contingent upon successful completion of the capital dredge to deepen the main approach channel. Direct employment at the port is expected to fall from 1,401 in 2009 to 687 in 2030 if the master plan is not implemented (Roger Tym and Partners, 2011). The associated gross direct GVA generated is expected to fall from £75m in 2009 to £37m in 2030 (Roger Tym and Partners, 2011).</p> <p>An initial Environmental Impact Assessment (EIA) and licence application for the capital dredge were submitted in 2009 but were not approved, and will therefore need to be resubmitted once aspects of the application that were deemed unsatisfactory have been addressed. The EIA identified that 'sediment deposition is predicted not to occur to the east of the Carrick Roads and therefore it is not anticipated that there will be any impact on the large live maerl bank present at St Mawes Bank' (Royal Haskoning, 2009).</p>	<p>a reduction of £3.375m/yr (Finding Sanctuary; see Annexes H and O for details of the assumptions used in these calculations). Net of displacement and substitution effects (economic activity undertaken at other UK and non-UK ports instead of at the Port of Falmouth) it is estimated that there would be a net direct impact on UK GVA of £0.035m/yr (see Annex N for details of assumptions made in these calculations). The impact on the local economy would be the full gross direct impact of £3.375m/yr. The local socioeconomic impacts may be significant and are likely to include loss of jobs associated with the bunkering and RFA contract activities. The financial impact on the Port of Falmouth would be an average loss of revenue of £5.22m/yr.</p> <p><i>Port masterplan and planned capital dredge:</i> As set out under Scenario 1, when the licence application for the capital dredge is resubmitted, the EIA will need to explicitly consider the potential impacts on the rMCZ's features and their conservation objectives. This is expected to result in an additional one-off cost of producing the revised EIA of approximately £0.007m. The EIA that has already been undertaken for the planned capital dredge (Royal Haskoning, 2009) identifies that the dredge is not expected to impact on the maerl bank at St Mawes Bank'. However, to reflect the port's concerns that, following resubmission of the EIA, mitigation of the impacts of potential (unintentional) deposition of dredged material within the rMCZ may be required, the costs are included in this scenario. If mitigation was required, it may be possible for this to be provided if the dredging was restricted to outflowing tides (Natural England, pers. comm., 2011). As the dredge operation is currently planned to operate on a continuous basis, this mitigation may result in a doubling of the time taken to complete the dredge, resulting in approximately a £24m increase in its cost (equal to a 100% increase in the current estimated cost) (Falmouth Harbour Commissioners, pers. comm., 2011).</p> <p>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.</p> <p><i>Future harbour development:</i> 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</p>
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	<p>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.</p> <p><u>Overall:</u> The present value of costs (from loss of revenue as a result of the removal of the Cross Roads buoy; increased assessment costs for the planned capital dredge and additional mitigation requirements for the planned capital dredge), measured as the net effect on UK GVA over the timeframe of the IA, is estimated to be £23.7m.</p>
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Table 2d. Recreation		rMCZ Reference Area The Fal
Source of costs of the rMCZ under Policy Option 1		
Recreational angling management scenario: Closure of rMCZ to recreational angling and anchoring (except in emergency).		
Recreational boating management scenario: Closure of rMCZ to anchoring (including anchoring of racing marks) (except in emergency).		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
Angling: The rMCZ is not known as a prolific angling site but some boat angling occurs. Angling boats often anchor within the rMCZ, particularly in poor weather as the area is relatively sheltered. There is some shore angling, although the coastline is relatively inaccessible (Cornish Federation of Sea Anglers, 2011; Port of Truro, pers. comm., 2011). Species targeted include thornback ray, bull huss, small conger eels, spotted ray, pollack, small bass and occasionally mullet (Cornish Federation of Sea Anglers, 2011).	<p>Anglers visiting the area are likely to respond to the closure by fishing at other sites in the estuary. During poor weather or easterly winds suitable alternative sites are limited. It is unclear whether this may result in an overall reduction in angling in the wider area.</p>	
Recreational boating: There are 5 main sailing clubs (Restrouquet Sailing Club, Mylor Yacht Club, Flushing Sailing Club, Royal Cornwall Yacht Club and St Mawes Sailing Club) – within the Falmouth area with a total of approximately 5,480 members (Port of Falmouth Sailing Association [PoFSA], pers. comm., 2011). There are an estimated 5,575 marina berths and moorings within the Fal Estuary (Port of Truro, pers.com., 2011).	<p>The rMCZ would affect anchoring by cruising boats as well as a proportion of the racing that occurs in the estuary, as anchoring of boats (except in emergency) and racing marks would not be permitted.</p> <p>There are alternative anchorage locations for visiting boats, but use of these is limited in easterly winds and periods of poor weather (Port of Truro, pers. comm., 2011). The rMCZ may therefore reduce anchorage opportunities for recreational vessels and limit the ability</p>	

Table 2d. Recreation	rMCZ Reference Area The Fal
<p>There is anchoring by motorised and non-motorised recreational boats within the rMCZ during the summer, particularly when there are easterly winds. Anchoring also occurs in the rMCZ when boats are sheltering from bad weather (PoFSA, pers. comm., 2011; Port of Truro, pers. comm., 2011). Estimates of the number of boats anchoring in the rMCZ range from 20 boats on summer days with easterly winds (Port of Truro, pers. comm., 2011) to a total of between 750 and 1,500 boats over the course of a year (PoFSA, pers. comm., 2011). It is free to anchor within the rMCZ area, unlike some other parts of the estuary.</p> <p>Providers of watersports training anchor their coaching and safety boats and lay course marks and operational markers within the rMCZ. The eastern shore of the Carrick Roads (which the rMCZ sits within) is a very important area for watersports training, especially when the wind direction is from the east. Windsport International is located on the banks of the Fal and offers a variety of windsport activities, including sailing, kayaking, windsurfing, canoeing and powerboating. Windsport runs courses in these activities for both individuals and groups and provide international coaching. Much of its activity takes place in and around the rMCZ, all of which involves anchoring of various boats and markers (Windsport, pers. comm., 2012).</p> <p>The area of the Carrick Roads (within which the pMCZ is situated) is regularly used for racing. Approximately 250 race events providing nearly 41,000 participant racing days (defined as the number of days' sailing by individuals) were estimated to take place in the Carrick Roads in 2011, accounting for over 90% of all race events and over 80% of all participant racing days in Falmouth. The participants in all Falmouth race events are estimated to spend nearly £2.3m per year in the local economy (see Annex N for calculations and assumptions).</p> <p>Start and finish buoys and course buoys (typically 8 anchored marks) are installed for each day of racing. Additionally, a committee boat is anchored. The locations of the start, finish and course buoys, and the committee boat depend on the conditions. The St Mawes Bank, which is inside the rMCZ, is</p>	<p>of participants to carry out their activities in such conditions (PoFSA, pers. comm., 2011; Port of Truro, pers. comm., 2011).</p> <p>The rMCZ is likely to affect the level of watersports training that takes place in the rMCZ. This may impact on the overall provision of watersports training in the Fal due to the importance of the eastern shore of the Carrick Roads for safe activities in easterly winds. Measures undertaken by watersports training providers so that they do not need to anchor vessels or markers in the rMCZ may increase risks to safety. The rMCZ may affect the businesses that offer training activities within the area of the rMCZ. (Windsport International, pers. comm., 2012).</p> <p>The rMCZ would limit the ability of race officers to set appropriate start lines and courses in the Carrick Roads area which may result in :</p> <ul style="list-style-type: none"> • increased likelihood of boats colliding as a result of inappropriate start lines and the first course windward mark being set too close to the start line. High numbers of collisions have occurred in the past as a result of an inappropriately set windward mark (Traditional Fleet Race Officer, pers. comm., 2011); • a reduced number of races for classes that can only race in the Carrick Roads area (PoFSA, pers. comm., 2011); • a reduced number of evening races (time constraints mean that the Carrick Roads area is the only place where these races can be held) (PoFSA, pers. comm., 2011); • racing in poor weather, when the Carrick Roads is the only safe race location, no longer being possible (PoFSA, pers. comm., 2011). <p>The above would constrain the range of classes that can race in Falmouth, and reduce the number of days on which good quality, safe race courses can be set. This would affect the quality of the racing available in Falmouth and the ability of the clubs to attract national and international events. There may also be a reduction in club membership if boat owners chose to relocate their boats from moorings and berths in Falmouth to elsewhere as a result of the constraints on racing. (PoFSA, pers. comm., 2011)</p> <p>It is estimated that around 50% of all races in the Carrick Roads could be affected by the</p>

Table 2d. Recreation	rMCZ Reference Area The Fal
<p>an ideal place for racestarts in a range of winds, and anchoring of buoys and the committee boat is constrained to this area for races in the Carrick Roads area by the deep Carrick Roads shipping channel and the shallow Mylor Bank (Restronguet Sailing Club, pers. comm., 2011). At Falmouth Week 2011, 5 of the 7 races were started from within the rMCZ (Falmouth Week race officer, pers. comm., 2011).</p> <p>Many classes of boat, including both large and small working boat classes, Gaffers, Toshiers, Sunbeams, St Mawes ODs, Ajaxes, Shrimpers and a variety of dinghies race within the Carrick Roads area (Traditional Fleet Race Officer, pers. comm., 2011). For many, sailing outside the Carrick Roads in the bay is not safe, and it would be impossible to provide adequate safety cover to allow for it (Traditional Fleet Race Officer, pers. comm., 2011). In addition, evening racing only takes place in the Carrick Roads area, as there is insufficient time for boats to race in places further from the clubs, such as the bay.</p> <p>The wide range of racing that can be provided for in Falmouth, and the ability to set a course that allows safe sailing in most weather conditions, is key to its popularity (Restronguet Sailing Club, pers. comm., 2011). The majority of races occur in the spring through to early autumn (typically April to October) and there are occasional races in the winter. Race events include village regattas, special events and open championships including the Olympic Finn class qualifiers in 2012, the world championships for disabled sailors in 2013 and Falmouth Week. Falmouth Week is held annually and is the second largest sailing event in the UK after Cowes Week, and is thought to attract 80,000 additional visitors to Falmouth each year (Henri Lloyd Falmouth Week, 2011).</p>	<p>rMCZ (PoFSA, pers. comm., 2011). Two sets of analysis of local wind data indicate that on between 18% (Private individual, pers. comm., 2011) and 55% (Royal Cornwall Yacht Club, pers. comm., 2012) of race days the wind direction is such that races need to be started from within the rMCZ. Ultimately, the reduction in race options may affect the ability to attract national and international events (as described above), and overall it is estimated that there could be a 25% reduction in the number of race events held in Falmouth (Carrick Road and Falmouth Bay areas).</p> <p>In the absence of more detailed information, the economic impact of the rMCZ is estimated by assuming that the 25% reduction in the number of race events translates into a 25% reduction in participant expenditure and expenditure by local boat owners. It is estimated that gross direct local expenditure associated with Falmouth racing could reduce by £0.572m/yr as a result of the rMCZ, resulting in an associated reduction in gross direct GVA of £0.269m/yr (see Annex N for assumptions and calculations). Allowing for a redistribution of the lost racing expenditure into expenditure on other activities in the local area and into expenditure on racing and other activities in other UK locations, it is estimated that there would be a reduction in local GVA of £0.192m/yr and in UK GVA of £0.067m/yr (see Annex N for assumptions and calculations).</p> <p>Consideration has been given by Natural England to whether a specific licence to anchor could be granted for the committee boat in order to enable start lines to continue to be set within the rMCZ. It has not been possible to establish the likelihood of this and as such it has not been included as a management scenario. However, it should be noted that if this were viable then the impacts on racing would be significantly reduced.</p>

Table 2e. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site	rMCZ Reference Area The Fal
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alone
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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area The Fal
Ports, harbours, shipping and disposal (transit of ships); Recreation (water skiing, including existing water ski area markings and moorings, swimming); Research and education; Water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

<p>Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale³⁵</p> <p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.</p>	rMCZ Reference Area The Fal
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³⁵ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A5.1 Subtidal coarse sediment	BSH	✓	✓	X	This site has not met the ENG target for viability	Recover to reference condition			
A5.5 Subtidal macrophyte- dominated sediment	BSH	✓	✓	X	This site has not met the ENG target for viability	Recover to reference condition		Only national example for reference condition.	Only national example for reference condition.
A5.2 Subtidal sand	BSH	✓	✓	X	This site has not met the ENG target for viability	Recover to reference condition			
A2.1 Intertidal coarse sediment	BSH	✓	✓	X	This site has not met the ENG target for viability	Recover to reference condition			
A1.3 Low energy intertidal rock	BSH	✓	✓	X	This site has not met the ENG target for viability	Recover to reference condition		Only regional example for reference condition.	
Maerl beds	FOCI Habitat	X	X	✓	Only two replicates within regional	Recover to reference condition	Only regional example listed for reference condition.	Rare/limited distribution at MCZ and UK	Rare/limited distribution at MCZ and UK

Annex I2. Impact Assessment materials (Finding Sanctuary).

					network			level.	level.
Seagrass beds	FOCI Habitat	✓	✓	✓	None	Recover to reference condition		Limited distribution at MCZ and UK level. This habitat is additionally important for the supported species and its wider ecological role (nursery area for juvenile species, stabilising sediments).	Limited distribution at MCZ and UK level. UK BAP Priority habitat. OSPAR List of Threatened and/or Declining Species and Habitats.
Coral maerl <i>Lithothamnion corallioides</i>	FOCI Species	X	X	✓	Only replicate within national network	Recover to reference condition	This has not met ENG guidelines for replication, however, it cannot be met in this region as the feature is not present in any other locations.	Rare/limited distribution at MCZ and UK level. Only national example for reference condition.	Rare/limited distribution at MCZ and UK level. Only national example for reference condition.
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓	None	Recover to reference condition		Only regional example for reference condition.	
Common maerl <i>Phymatolithon calcareum</i>	FOCI Species	✓	✓	✓	None	Recover to reference condition	This has not met ENG guidelines for replication,	Rare/limited distribution at MCZ and UK	Rare/limited distribution at MCZ and UK

Annex I2. Impact Assessment materials (Finding Sanctuary).

							however, it cannot be met in this region as the feature is not present in any other locations.	level. Only national example for reference condition.	level. Only national example for reference condition.
European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓ * 1	✓	N/A	None	Recover to reference condition	This feature is not protected in any existing MPAs within the SW region, and is on the minimum replication within MCZs and recommended reference areas. This FOCI is currently only reaching the minimum replication target.	The eel is a UK BAP priority species and IUCN red data book listed. Only national example for reference condition.	The eel is a UK BAP priority species and IUCN red data book listed. Only national example for reference condition.

Burgundy maerl paint weed <i>Cruoria cruoriaeformis</i>	FOCI Species	✓	✓	Annex 12. Impact	One of only two replicates within national network	Recover to reference condition	This has not met ENG guidelines for replication, however, it cannot be met in this region as the feature is not present in any other locations.	Rare/limited distribution at MCZ and UK level. Only national example for reference condition.	Rare/limited distribution at MCZ and UK level. Only national example for reference condition.
Couch's goby <i>Gobius couchi</i>	FOCI Species	✓	X	X	This site has not met the ENG target for viability	Recover to reference condition	There are only two sites proposed for this species in the national network.	This species is very rare and this is the only one of two sites put forward for designation nationally. Only national example for reference condition.	Outside of the Finding Sanctuary Region, no site has been proposed for this feature. Only national example for reference condition.
The red algae <i>Grateloupia montagnei</i>	FOCI Species	X	X	X	This site has not met the ENG target for viability.	Recover to reference condition	There is no confidence in the presence of this feature at this site.	Rare/limited distribution at MCZ and UK level. Only national example for reference condition.	Rare/limited distribution at MCZ and UK level. Only national example for reference condition.
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * 2					
Overlaps with existing MPAs				✓					

Additional comments and site benefits:

¹ FOCI species *Anguilla anguilla* is not protected in any existing MPAs within the SW region. The MCZ designations are needed to meet the minimum ENG target for replication.

² Site sits within a 'Benthic Hot Spot' (top 25% at the regional level)

The goby *Gobius couchi* that is recorded here has only been recorded in 4 locations around the UK. This site is therefore an important site for the species and is one of only two sites within the national network that is recommended for this feature.

This site has been put forward particularly for its rich benthic habitat and species diversity; with two important FOCI habitats present (maerl beds and seagrass beds) (SAD in (Lieberknecht, et al. 2011)). Maerl beds attract many other species, for example the rare Couch's goby (*Gobius couchi*) (SAD in (Lieberknecht, et al. 2011)).

This is the only reference area, nationally, proposed for subtidal macrophyte-dominated sediments; *Lithothamnion corallioides*; *Phymatolithon calcareum*; *Anguilla anguilla*; *Cruoria cruoriaeformis*; and *Gobius couchi*. This is the only reference area, regionally, proposed for low energy intertidal rock; maerl beds; and *Ostrea edulis*.

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 5a. Fish and shellfish for human consumption		rMCZ Reference Area The Fal
Baseline	Beneficial impact under Policy Option 1	
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. Both maerl beds and seagrass beds act as nursery areas for commercial fish and shellfish species. There is evidence that maerl beds provide structurally complex feeding areas for commercially important juvenile fish species such as Atlantic cod (Fletcher and others, 2012). The	<p>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 this are set out in Table 2b.</p> <p>Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption.</p>	<p>Anticipated direction of change:</p> 

Table 5a. Fish and shellfish for human consumption	rMCZ Reference Area The Fal	
<p>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.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks. In particular the nursery area function of the seagrass and maerl beds may be enhanced, providing beneficial spill-over effects of fish and shellfish.</p> <p>As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.</p> <p>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.</p>	<p>Confidence: Low</p>

Table 5b. Recreation	rMCZ Reference Area The Fal	
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p> <p>A description of on-site angling activity is set out in Table 2d. It has not been possible to estimate the value of angling in the site.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to reference condition.</p> <p>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).</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Low</p>
<p>Diving: Diving is not known to take place in the rMCZ.</p>	<p>N/A</p>	<p>N/A</p>
<p>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 not in reference condition.</p>	<p>If the conservation objectives of the features are achieved the features will be recovered to reference condition.</p> <p>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 in the site and</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5b. Recreation	rMCZ Reference Area The Fal	
<p>There are regular sightings of dolphins and porpoises in the Fal. Species include the bottlenose, white-beaked, common, striped, Atlantic white-sided and Risso's dolphin. Many aquatic birds can be spotted on the Fal: little egrets, curlews, shelducks, swans, oystercatchers and kingfishers can all be seen. Local companies offer boat trips to explore the local wildlife. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>therefore the value of the ecosystem service.</p> <p>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.</p>	<p>Confidence: Low</p>

Table 5c. Research and education	rMCZ Reference Area The Fal	
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>The estuary has been subject to a variety of research activities. Within the rMCZ surveys of the seagrass and maerl have previously been undertaken. Future research is likely to occur as a result of the estuary's Special Area of Conservation designation and plans for redevelopment of part of the Port of Falmouth. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>A wide variety of education events and interpretation are provided around the Fal Estuary by organisations including the Cornwall Wildlife Trust. The extent of activity within the rMCZ is unknown but is only likely to a fraction of that over the wider estuary. It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	<p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Reference Area The Fal
Baseline	Beneficial impact under Policy Option 1	
<p>Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Seagrass beds are known to be particularly efficient carbon sinks (Fletcher and others, 2012).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems. Maerl forms complex and heterogeneous habitats which provide a wide range of niches for infaunal and epifaunal organisms. Rocky habitats in estuaries make a significant contribution to the overall diversity of the estuary (Fletcher and others, 2012).</p> <p>Natural hazard protection: The features of the site, in particular the seagrass beds and intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved the features will be recovered to reference condition.</p> <p>Improved habitat condition and a reduction in anthropogenic pressures may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Reference Area The Fal
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Reference Area The Fleet**Site area (km²): 2.1**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts			rMCZ Reference Area The Fleet	
1a. Ecological description				
<p>The Fleet recommended Marine Conservation Zone (rMCZ) Reference Area sits within the northern half of the Fleet Lagoon and the northern, eastern and western boundaries follow the mean high water mark. The Fleet rMCZ Reference Area sits within the boundary of the Special Area of Conservation, Special Protection Area and Site of Special Scientific Interest that cover the Fleet Lagoon and Chesil Beach.</p> <p>The Fleet is a shallow tidal inlet some 13km long, separated from the sea by Chesil Beach, and connected to the sea by a narrow channel entering Portland Harbour. Sea water percolates through Chesil Bank, influencing salinity along the length of the Fleet. Low freshwater input results in fully saline or polyhaline conditions throughout most of the lagoon; only the Abbotsbury embayment at the western end has low-salinity brackish water.</p> <p>The coarse sediments of the inlet channel are predominately colonised by brown and red algae, whereas the soft mud beds of the lagoonal basin support seagrass (<i>Zostera</i> and <i>Ruppia</i> spp.) and green algal meadows. The Fleet is the largest saline/brackish lagoon in England, and as a result has been designated as a protected area under a range of designations (Lieberknecht and others, 2011). The rMCZ contains rare lagoon species that have very limited distribution due to their specific habitat requirements (Natural England, pers. comm., 2012).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Coastal saltmarshes and saline reedbeds	< 0.01	-	Unfavourable Condition	Recover to Reference Condition
Intertidal coarse sediment	0.02	-	Unfavourable Condition	Recover to Reference Condition
Intertidal mud	0.11	-	Unfavourable Condition	Recover to Reference Condition
Intertidal sediments dominated by aquatic angiosperms	< 0.01	-	Unfavourable Condition	Recover to Reference Condition
Subtidal coarse sediment	1.80	-	Unfavourable Condition	Recover to Reference Condition
<i>Habitats of Conservation Importance</i>				
Seagrass beds	1.09	5	Unfavourable Condition	Recover to Reference Condition
<i>Species of Conservation Importance</i>				

<i>Tenellia adspersa</i>	-	1	Unfavourable Condition	Recover to Reference Condition
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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 The Fleet
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
A World War II anti-tank ditch is located behind Chesil Beach (Lee, Stelzenmüller & Rogers, 2010), although it is not clear whether this is located in the rMCZ. 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 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 2b. Commercial fisheries	rMCZ Reference Area The Fleet
Source of costs of the rMCZ under Policy Option 1	

Table 2b. Commercial fisheries		rMCZ Reference Area The Fleet										
Management scenario 1: Closure of entire rMCZ to all commercial fishing.												
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1										
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). Fyke netting occurs under licence with the Environment Agency. There is no other commercial fishing in the rMCZ. Estimated total value of UK vessel landings from the rMCZ: £0.014m/yr.												
UK Nets: Fyke netting for eels occurs inside the rMCZ, in the western end of The Fleet, under authority from the Environment Agency. There is a closed season over the winter months. No other forms of netting occur within the rMCZ (Environment Agency, pers. comm., 2011). Though gill netting occurs in The Fleet this is concentrated in the eastern end, outside the rMCZ. There are currently 6 active fyke net licences, all held by individuals from the Weymouth area, for a total of 100 nets. Given declines in eel populations nationally an increase in the number of authorities granted is considered unlikely (Environment Agency, pers. comm., 2011). Value of net landings of eels is estimated at £0.014m/yr based on the volume of landings between 2007 and 2010 (Environment Agency, pers. comm., 2011) and an average price of eels of £6/kg between 2007 and 2010 (The Fleet eel fishers and Environment Agency, pers. comms., 2011).		Scenario 1: The rMCZ is likely to result in the closure of the eel fishery. This would have an impact on the incomes of the 6 affected fishers. Based on the estimate set out in the baseline, the annual value of UK net landings affected: <table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.014</td></tr></table>		£m/yr	Scenario 1	Value of landings affected	0.014					
£m/yr	Scenario 1											
Value of landings affected	0.014											
Total direct impact under Policy Option 1												
Total direct impact on UK commercial fishing:		Estimated annual value of UK vessel landings and gross value added (GVA) affected: <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.014</td><td>0.004</td></tr><tr><td>GVA affected</td><td>0.006</td><td>0.002</td></tr></table> The best estimate is based on an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.		£m/yr	Scenario 1	Best estimate	Value of landings affected	0.014	0.004	GVA affected	0.006	0.002
£m/yr	Scenario 1	Best estimate										
Value of landings affected	0.014	0.004										
GVA affected	0.006	0.002										

Table 2b. Commercial fisheries		rMCZ Reference Area The Fleet
Impact on non-UK commercial fishing:	None	

Table 2c. Recreation		rMCZ Reference Area The Fleet
Source of costs of the rMCZ under Policy Option 1		
Wildfowling: Closure of rMCZ to wildfowling.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
Wildfowling: Wildfowling is permitted between Langton Herring (in land from the rMCZ) and the Narrows (to the south-east of the rMCZ) from 1 October through to 20 February. Whilst wildfowling do not enter the rMCZ, they may shoot birds flying over it. Three of the best shoot locations are on the shore of the lagoon, on the rMCZ boundary (The Fleet Warden, pers. comm., 2012). Wildfowling in the area is regulated through the issue of permits to the Fleet Wildfowling Group by Ilchester Estates. In total 65–75 permits are issued each year. The level of activity has remained broadly similar over the years with 400–600 birds taken each year, the majority of which comprise wigeon and pochard (Moxom & Colombé, 2010).	Wildfowling within the rMCZ would not be permitted as it is extractive (Natural England, pers. comm., 2012) (JNCC and Natural England, 2010). As three of the best locations for shooting are on the rMCZ boundary, from which participants shoot over the rMCZ, it is anticipated that the rMCZ would result in a significant deterioration in the quality of wildfowling available on the Ilchester Estate (The Fleet Warden, pers. comm., 2012). This may result in a reduced level of participation and a reduction in revenue generated through wildfowling for Ilchester Estates. However, it has not been possible to obtain any estimates of the impact on participation rates or the associated financial implications.	

Table 2d. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and not for this site alone	rMCZ Reference Area The Fleet
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 recommended Marine Conservation Zone (MCZ) under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Reference Area The Fleet
Recreation (swannery, rowing boats, dedicated access points); research and education; water abstraction, discharge and diffuse pollution*.	

* The IA assumes 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).

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale³⁶ ✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.								rMCZ Reference Area The Fleet	
ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional MCZ	Ecological Importance at wider scale

³⁶ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

					minimum guidelines			level	
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓ * 1	None	Recover			
A2.3 Intertidal mud	BSH	✓	✓	✓ * 1	None	Recover			
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	✓	✓ * 1	None	Recover			
A2.6 Intertidal sediments dominated by aquatic angiosperms	BSH	✓	✓	✓ * 1	None	Recover			
A5.1 Subtidal coarse sediment * 3	BSH	✓	✓	✓ *	None	Recover	This BSH is currently only reaching the minimum adequacy target	Only a small proportion (<1%) of this BSH is currently protected within existing MPAs in the FS area	
Seagrass beds	FOCI habitat	✓	✓	✓	None	Recover		Many records of this FOCI habitat within	

Annex I2. Impact Assessment materials (Finding Sanctuary).

								this rRA. This feature has limited distribution.	
Lagoon sea slug <i>Tenellia adspersa</i>	FOCI Species	✓ * 1	✓	✓ * 2	None	Recover	Only site proposed for this feature within the region. This feature has very limited distribution.	Only site proposed for this feature within the region. This feature has very limited distribution.	This feature has very limited distribution in the whole MCZ project area.
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				✓ * 3					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				None					
Overlaps with existing MPAs				✓					

This recommended reference area is not within an rMCZ, so has been treated as a standalone rMCZ when assessing viability, adequacy and replication.

Additional comments and site benefits:

¹ The FOCI species lagoon sea slug (*Tenellia adspersa*) only has one replicate in the FS project area, as it has a very limited distribution. The Fleet is the only known location for it in the Finding Sanctuary regional project area (Lieberknecht, et al. 2011), and there are very few records for this species in England (13 on the National Biodiversity Network (NBN) gateway). Therefore the replication target is met.

Caecum armoricum has a limited distribution within the SW project area and is found in large numbers at high densities within The Fleet (Baldock and Bass 2011).

³ The recommended reference area includes a large proportion of The Fleet lagoon, which is a rare example of a saline lagoon and is part of the Jurassic Coast world heritage site.

There is scientific value in this site because significant amounts of research have been carried out in the Fleet due to the numerous designations.

² The ENG states that the FOCI species lagoon sea slug (*Tenellia adspersa*) is found in saline lagoons, and viability is dependent on the whole lagoon being included. In this location the whole lagoon is not included, but it is uniquely large in size with a significant amount included, and the remaining area is protected in existing designations so the lagoon is protected in its entirety to support the feature. Furthermore, all records of *Tenellia adspersa* are within the current recommended reference area boundary so it is considered viable (Seaward 1978).

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 5a. Fish and shellfish for human consumption		rMCZ Reference Area The Fleet
Baseline	Beneficial impact under Policy Option 1	
<p>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. Seagrass beds within the rMCZ provide important nursery areas for flatfish (JNCC, 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 service provided is assumed to be commensurate with that provided by the features of the site when not in reference condition.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>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 this are set out in Table 2b.</p> <p>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. In particular the nursery area function of the seagrass beds may be enhanced,</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5a. Fish and shellfish for human consumption		rMCZ Reference Area The Fleet
	<p>providing beneficial spill-over effects of fish and shellfish.</p> <p>As no fishing will be permitted within the rMCZ, no on-site benefits will be realised.</p> <p>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.</p>	

Table 5b. Recreation		rMCZ Reference Area The Fleet
Baseline	Beneficial impact under Policy Option 1	
Angling: Recreational angling is not known to take place in the rMCZ.	N/A	N/A
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
<p>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 not in reference condition.</p> <p>The Fleet rMCZ Reference Area is home to a wide variety of water birds including the oldest managed swan population in the world. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved the features will be recovered to reference condition.</p> <p>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 in the site and therefore the value of the ecosystem service.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low:</p>

Table 5c. Research and education	rMCZ Reference Area The Fleet
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Table 5c. Research and education		rMCZ Reference Area The Fleet
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>There is a significant level of interest in research activities around the Fleet, including in the marine environment. The Fleet Study Group was founded in 1975 by the Natural Environment Research Council to collect scientific and historic information about the Fleet and Chesil Beach, and to consider the environmental effects of natural and man-made change. At any one time there are 15 to 20 members of the group (Chesil Bank and the Fleet Nature Reserve, 2010). It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Education infrastructure is based around the Chesil Beach Visitor Centre and much of the activity of the centre is focused on the Fleet Lagoon. However, it is likely that much of this occurs at the eastern end of the lagoon, outside the rMCZ, where the centre is located. The centre offers a range of educational visits for schools, and walks, talks and training for the general public (Dorset Wildlife Trust, 2011). Approximately 29,000 people visit the centre every year (average of the last ten years) (Chesil Bank and the Fleet Nature Reserve, 2008). At the western end of the lagoon, overlapping with the rMCZ, is a swannery. Interpretation is provided at the swannery. It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	<p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ Reference Area The Fleet
Baseline	Beneficial impact under Policy Option 1	
<p>Regulation of pollution: The features of the site contribute to the bioremediation of waste and sequestration of carbon. Coastal saltmarshes and seagrass beds are known to be particularly efficient carbon sinks and cadmium is stored in sediment by cord grass <i>Spartina anglica</i> which grows in intertidal mud (Fletcher and others, 2012).</p> <p>Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012).</p> <p>Natural hazard protection: The features of the site, in particular the coastal saltmarshes, seagrass beds and intertidal habitats, contribute to local flood and storm protection (Fletcher and others, 2012).</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>	<p>If the conservation objectives of the features are achieved the features will be recovered to reference condition.</p> <p>Improved habitat condition and a reduction in anthropogenic pressures may increase site benthic biodiversity and biomass, improving the regulating capacity of the site habitats.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Reference Area The Fleet
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

rMCZ Western Channel**Site area (km²): 1,613.5**

- This site has been proposed for designation under Policy Option 1 only.

Table 1. Conservation impacts				rMCZ Western Channel
1a. Ecological description				
The northern tip of the Western Channel recommended Marine Conservation Zone is located approximately 54km to the south-east of the Lizard Peninsula. The depth of the sea bed is in the 50–100 metre range, with the western end of the site dipping below the 100 metre contour. The sea-bed habitat is characterised by coarse sediment, rock and mixed sediment. There is anecdotal evidence that the rock habitat here consists of cobbles, not bedrock. The area is of additional ecological importance in that it is an area of productive frontal systems and of importance for sea birds and cetaceans, and intersects with areas of higher than average benthic biodiversity (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	756.20	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mixed sediments	175.42	-	Unfavourable Condition	Recover to Favourable Condition
Moderate energy circalittoral rock	676.23	-	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 Western Channel
Source of costs of the rMCZ under Policy Option 1		
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; zoned closure of area of moderate energy circalittoral rock and sub-tidal mixed sediment to		

Table 2a. Commercial fisheries		rMCZ Western Channel				
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 under Policy Option 1				
Overview: The rMCZ is situated on the edge of the UK’s 200nm (nautical mile) fishery limit and exclusive economic zone, and the median line between UK and French waters. Vessels from a number of different nations, predominantly UK, French and Belgian, are active in the rMCZ (Lee, 2010; South West Fishing Industry Group, 2011). Bottom trawling is the main type of fishing in the rMCZ, with activity concentrated in the western part of the rMCZ (MCZ Fisheries Model). There is also a significant amount of netting and a relatively low level of fishing with other gears (MCZ Fisheries Model). Estimated total value of UK vessel landings from the rMCZ: £0.204m/yr.						
UK Dredges: The rMCZ is not a regular scalloping ground, although there is scalloping all around it. Occasional scalloping activity occurs in the rMCZ, typically to investigate the viability of the area, and the rMCZ area has been successfully dredged for scallops in the past (Scallop dredge owner, pers. comm., 2011). Estimated value of UK dredge landings from the rMCZ: £0.001m/yr. The rMCZ has historically been dredged for scallops 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 would be targeted again 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 (Defra, 2011). This may result in higher annual landings from the rMCZ.		Scenario 1: No impacts are anticipated under Scenario 1. Scenarios 2, 3 and 4: As the rMCZ is not currently a regular scalloping ground it is not expected to have a significant impact on vessels’ current fishing patterns under these scenarios. However, it would 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 these historical areas again, if viable dredges can be landed (Scallop dredge owner, pers. comm., 2011). As such the estimate of the value of landings affected per year 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	Scenario 3	Scenario 4
		Value of landings affected	0.000	0.001	0.001	0.001
UK Bottom trawls: Large beam trawlers, typically over 25 metres in length, are active in the western part of the pMCZ principally targeting monkfish and sole (MMO, 2011a). The pMCZ lies on the edge of a large, heavily trawled area, which extends north and west (MCZ Fisheries Model). There is also a low level of activity by otter trawls, principally in the northern corner of the pMCZ (MCZ Fisheries Model). Estimated value of UK bottom trawl landings from the pMCZ: £0.143m/yr.		Scenario 1: No impacts are anticipated under Scenario 1. Scenarios 2, 3 and 4: Displaced beam trawlers are likely to increase effort to the north and west of the rMCZ. However, some effort may also be pushed east, particularly by vessels from ports from east of the rMCZ. Potential increases in effort in ICES Rectangle 27E4 as a result of recent success in cuttlefish landings would be affected by the rMCZ. The rMCZ covers approximately 11% of the ICES Rectangle, thereby reducing the available open ground to trawlers. Its shape may				

Table 2a. Commercial fisheries		rMCZ Western Channel			
In late 2010 and early 2011 there were significant catches of cuttlefish from the western half of the pMCZ (South West Fishing Industry Group, 2011). Cuttlefish lands by beam trawlers from within ICES Rectangle 27E4, which overlaps the western half of the pMCZ totalled over £0.308m in 2010 (data for 2011 is not yet available), more than four times the average from the previous three years. The high value of cuttlefish landings, which saw the Newlyn port landings record broken nearly ten times in two week, may lead to an increase in the number of days fishing done in the area by trawlers if similar catches can be landed in forthcoming years (beam trawl owner, pers. com., 2011).	hinder tow lines in north/south directions.				
	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	0.143	0.143	0.143	
The displacement of fishing effort from the Western Channel rMCZ may put pressure on the Mid-channel Potting Agreement – an agreement between mobile and static gear fishers for seasonal trawling closures to a series of fishing grounds in the mid-channel, to the east of the rMCZ. Estimates of UK vessel landings from the areas included in the agreement are £0.764m/yr by pots, £0.287m/yr by dredges and £0.753m/yr by bottom trawls. The success of the agreement, and the landings obtained by fishers in the area, may be affected if trawlers displaced from the rMCZ seek to change the location, number or period of the seasonal trawl closures (South West Fishing Industry Group, 2011).					
UK Pots and traps: There is a low level of potting along the eastern edge of the rMCZ by vessels in excess of 12 metres in length (MMO, 2011a). The rMCZ does not cover a regular potting ground (Cornish Fish Producers Organisation [CFPO], pers. comm., 2012), with activity concentrated east of the rMCZ in the area of the mid-channel potting agreement (MCZ Fisheries Model). Estimated value of UK pot and trap landings from the rMCZ: £0.010m/yr.					
Scenarios 1 and 2: No impacts are anticipated under scenarios 1 and 2.					
Scenarios 3 and 4: A low level of potting will be affected under these scenarios, as indicated by the estimated value of landings affected. The rMCZ does not cover a regular potting ground. Significant impacts are therefore not expected under these scenarios.					
Estimated annual value of UK pot and trap 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	0.008	0.010	
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					

Table 2a. Commercial fisheries		rMCZ Western Channel												
		range, and is likely to be less restrictive than that required for other gears.												
UK Nets: There is a low level of activity spread across much of the rMCZ. Vessels active in the wider area (defined as ICES Rectangles 27E4 and 27E5) are typically over 15 metres in length, and principally use set gill nets to target pollack, although a wide range of species are caught (MMO, 2011a). The rMCZ is not thought to cover a regular fishing ground for netters (CFPO, pers. comm., 2012). Areas of greater netting intensity are located to the north of the rMCZ (MCZ Fisheries Model). Estimated value of UK net landings from the rMCZ: £0.048m/yr.	Scenarios 1 and 2: No impacts are anticipated under scenarios 1 and 2.													
	Scenarios 3 and 4: Despite the relatively low value of landings per unit of area, as the rMCZ is large the total value of landings affected is relatively high (compared with other south-west rMCZs). However, as the rMCZ is not thought to cover a regular fishing ground for netters, significant impacts are not anticipated under these scenarios.													
	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>0.042</td><td>0.048</td></tr></table>	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	0.042	0.048			
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4										
Value of landings affected	0.000	0.000	0.042	0.048										
	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													
UK Hooks and lines: There is a very low level of fishing with lines in the rMCZ, as indicated by the value of landings estimate, and the rMCZ does not cover a regular fishing ground (CFPO, pers. comm., 2012). Estimated value of UK hook and line landings from the rMCZ: £0.001m/yr.	Scenarios 1 and 2: No impacts are anticipated under scenarios 1 and 2.													
	Scenarios 3 and 4: The rMCZ does not cover a regular fishing ground and the estimated value of landings affected is low. Therefore no significant impacts are expected under these scenarios.													
	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><0.001</td><td>0.001</td></tr></table>	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	<0.001	0.001			
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4										
Value of landings affected	0.000	0.000	<0.001	0.001										
	In establishing the draft conservation objectives, the site features were assessed as having													

Table 2a. Commercial fisheries		rMCZ Western Channel																							
		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 under Policy Option 1																									
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:																							
		<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td><td>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.144</td><td>0.194</td><td>0.202</td><td>0.022</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.060</td><td>0.083</td><td>0.087</td><td>0.009</td></tr></table>						£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate	Value of landings affected	0.000	0.144	0.194	0.202	0.022	GVA affected	0.000	0.060	0.083	0.087	0.009
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate																		
		Value of landings affected	0.000	0.144	0.194	0.202	0.022																		
		GVA affected	0.000	0.060	0.083	0.087	0.009																		
The best estimate is based on an assumption on the likelihood of the lowest and highest cost scenario occurring, and an assumption that 75% of value is displaced to other areas. This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this site.																									
Impact on non-UK commercial fishing: Non-UK vessels using static gears, bottom trawls/dredges and mid-water trawls, primarily French demersal trawlers and to a lesser extent Belgian beam trawlers, fish within the rMCZ (Lee, 2010). Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £2.301m/yr; static gears: £0.393m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates for other countries are not available.		Scenario 1: No impacts are anticipated under Scenario 1. Scenarios 2, 3 and 4: Non-UK vessels using static gears and bottom trawls/dredges, in particular French demersal trawlers and to a lesser extent Belgian beam 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 £2.301m/yr (bottom trawls/dredges) and £0.393m/yr (static gears). No information on the effect of the zoned closure to static gears or the impact on Belgian vessels is available.																							

Table 2b. National defence		rMCZ Western Channel
Source of costs of the rMCZ under Policy Option 1		
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 under Policy Option 1	
MOD is known to make use of the rMCZ for aerial, surface and 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 under Policy Option 1 and not for this site alone	rMCZ Western Channel
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 under Policy Option 1 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Western Channel
Cables (existing interconnectors and telecom cables), Commercial fishing (mid-water trawl)	

Contribution to Ecological Network Guidance

Table 4. An overview of features proposed for designation and how these contribute to the ENG guidelines for the regional MCZ project area and at a wider scale ³⁷								rMCZ Western Channel	
✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in italics indicate where SNCBs do not agree with the conservation objective recommended by the regional MCZ project (see Section 4.2). Where an asterisk (*) has been given in the table, more detail is provided in the narrative.								Ecological Importance at regional MCZ level	Ecological Importance at wider scale
ENG Feature	Represent-activity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level		
A4.2 Moderate energy circalittoral rock	BSH	✓	✓ * 1	✓	None	Recover	<p>This BSH is currently only reaching the minimum adequacy target. Out of all of the rMCZs, this site contributes the second largest area of moderate energy circalittoral rock.</p> <p>This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project</p>		

³⁷ copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Impact Assessment materials (Finding Sanctuary).

							area		
A5.1 Subtidal coarse sediment	BSH	✓	✓ * 2	✓	None	Recover	<p>This BSH is currently only reaching the minimum adequacy target.</p> <p>Out of all of the rMCZs and existing MPAs, this site contributes the second largest area of subtidal coarse sediment. This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project area</p>	Only a small proportion of this feature is captured in existing MPAs	Only a small proportion of this BSH is currently protected within existing MPAs in the Western Channel and Celtic Sea Regional Sea
A5.4 Subtidal mixed sediments	BSH	✓	✓	✓	None	Recover	<p>Out of all of the rMCZs and existing MPAs, this site contributes the largest area of subtidal mixed sediment. This site makes a significant contribution towards meeting the lower level target for this feature within the regional MCZ project</p>		

Annex I2. Impact Assessment materials (Finding Sanctuary).

							area		
Site considerations									
Connectivity				✓ * ³					
Geological/Geomorphological features of interest				✓ * ⁴					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * ⁵					
Overlaps with existing MPAs				None					

Additional comments and site benefits:

^{1,2} The adequacy guidelines for subtidal coarse sediment and moderate energy circalittoral rock have only just been achieved within this regional MCZ project area.

³ This site is essential for connectivity between EUNIS Level 2 sublittoral sediments and circalittoral rock habitats in the offshore area within this regional MCZ project area and that of Balanced Seas.

⁴ Although this rMCZ is not proposed directly for its geological or geomorphological features of interest, it is located in the middle of a large sandwave field.

⁵ Although it is not clear whether this site was selected on the basis of it being an area of additional ecological importance there are a number of ecological benefits which could be considered important and add value to this recommendation (see Annex 5 of JNCC and Natural England's advice on rMCZs for more detail on these). This rMCZ overlaps with an area of high benthic species biodiversity (Langmead, et al. 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 5a. Fish and shellfish for human consumption		rMCZ Western Channel
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>A description of on-site fishing activity and the value derived from it is set out in Table 2a.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ Western Channel
Baseline	Beneficial impact under Policy Option 1	
No recreational activities are known to occur in or near the recommended Marine Conservation Zone.	N/A	N/A

Table 5c. Research and education		rMCZ Western Channel
Baseline	Beneficial impact under Policy Option 1	
<p>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.</p> <p>No known research activities are currently carried out in the rMCZ.</p>	<p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p>Education: Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity is focused on the area of the rMCZ.</p>	<p>As the rMCZ is offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p> <p>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).</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ Western Channel
Baseline	Beneficial impact under Policy Option 1	
<p>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).</p>	<p>If the conservation objectives are achieved the features will be recovered to favourable condition.</p> <p>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5d. Regulating services		rMCZ Western Channel
<p>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).</p> <p>Natural hazard protection: As the site is offshore it is unlikely to contribute to providing natural hazard protection.</p> <p>It has not been possible to estimate the value of regulating services in the site.</p>		Confidence: Low

Table 5e. Non-use and option values		rMCZ Western Channel
Baseline	Beneficial impact under Policy Option 1	
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.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>