

## **Annex I2 Direct impacts arising from individual rMCZs (Option 2)**

### **1 Introduction**

1.1.1 This annex sets out the direct impacts of each of the 31 recommended Marine Conservation Zones (rMCZs) being proposed for designation in 2013 (Option 2).

1.1.2 Five 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<sup>1</sup>.
- 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<sup>2</sup>

### **2 Impact Assessment**

2.1.1 The remainder of this document sets out the individual rMCZ assessment

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<sup>1</sup> The site specific costs are based on the Impact Assessment material submitted to Defra in July 2011 by the regional projects. Revisions have been made to only account for

1) Changes in costs following updated SNCB advice on conservation objectives of sites. It has only been possible to take account of these changes for sites proposed for designated in 2013 and not for sites considered under future tranches.

2) Displacement impacts in the context of fisheries costs and

3) Updated information on renewables costs for Blackwater, Crouch, Roach and Colne Estuaries.

<sup>2</sup> Benefits information has been updated to account for changes in SNCB advice on conservation objectives.

## Contents

Chesil Beach and Stennis Ledges	p3
East of Haig Fras	p19
Isles of Scilly	p29
Padstow Bay and Surrounds	p56
Poole Rocks	p78
Skerries Bank and Surrounds	p91
South Dorset	p113
Southwest Deeps (West)	p128
Tamar Estuary Sites	p139
The Canyons	p153
The Manacles	p165
Torbay	p189
Upper Fowey and Pont Pill	p214
Whitsand and Looe Bay	p227
Stour and Orwell Estuaries	p249
Blackwater, Crouch, Roach and Colne Estuaries	p267
Medway Estuary	p292
Thanet Coast	p314
Folkestone Pomerania	p334
Beachy Head West	p352
Kingmere	p374
Pagham Harbour	p391
Hythe Bay	p401
Aln Estuary	p416
Rock Unique	p427
Swallow Sand	p436
North of Celtic Deep	p449
Fylde Offshore	p460
Cumbria Coast	p467
Hilbre Island Group	p492

**rMCZ Chesil Beach and Stennis Ledges****Site area (km<sup>2</sup>): 37.7**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts			rMCZ Chesil Beach and Stennis Ledges	
1a. Ecological description				
<p>The site shares a boundary with a number of existing and proposed environmental designations. The recommended Marine Conservation Zone (rMCZ) runs along the length of Chesil Beach from the top of the Fleet lagoon at Abbotsbury to Portland in the south-east, extending from the high water mark out to about 1.8km, with an extension to about 5km over the Stennis Ledges, an area of rocky ridges and rugose sea bed. The deepest parts of the site are approximately 40 metres below sea level. The nearby southern and western side of Portland has been mapped as an area of higher than average benthic species diversity and anecdotal evidence indicates the possible geological interest of the site, with soft lias reefs believed to be present.</p> <p>Chesil Beach itself is a linear, pebble and cobble beach which links the Isle of Portland in the east to the mainland in the west and extends for over 18km. The beach is separated from the mainland by a shallow tidal lagoon known as the Fleet (outside the rMCZ). The beach crest is intermittent at the western end, but becomes continuous from Abbotsbury with a maximum height of 7 metres increasing to 14 metres above sea level at Chesilton. There are marked variations in particle shape along the length of the beach.</p> <p>Rocky outcrops and boulders separated by patches of sand, mud and gravel have been observed down to 14 metres. Associations found were <i>Laminaria hyperborea</i> on bedrock and boulders, <i>Pagurus bernhardus</i>–<i>Nassarius reticulatus</i> on sand and Hydrozoa–Ascidacea–Porifera on all grades of rock debris (including <i>Lithothamnion</i> and <i>Ostrea edulis</i>). At the west end of Chesil Beach, an inshore narrow zone of pebbles/shingle has been observed extending from the beach, then a wider zone of pebbles/stones mixed with sand grading into a third zone of sand/mud. Associations found were <i>Pagurus bernhardus</i>–<i>Maja squinado</i> on pebbles on sand. The large boulders at Chesil Cove have a low algal diversity but support a rich Hydrozoa–Ascidacea–Porifera community.</p> <p><i>Eunicella verrucosa</i> and <i>Ostrea edulis</i> have been recorded in the rMCZ. Anecdotal evidence indicates the presence of bream nests and the Features of Conservation Importance habitat fragile sponge and anthozoan communities 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 infralittoral rock	< 0.01	-	Unfavourable Condition	Recover to Favourable Condition
High energy intertidal rock	0.03	-	Favourable Condition	Maintained at Favourable Condition

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Intertidal coarse sediment	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	26.15	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	4.27	-	Unfavourable Condition	Recover to Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Euinella verrucosa</i>	-	2	Unfavourable Condition	Recover to Favourable Condition
<i>Ostrea edulis</i>	-	2	Unfavourable Condition	Recover to Favourable Condition
<p><b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>High energy intertidal rock, Pink Sea Fan (<i>Euinella verrucosa</i>), Native Oyster (<i>Ostrea edulis</i>)</p>				

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

Table 2a. Archaeological heritage		rMCZ Chesil Beach and Stennis Ledges
<p><b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b></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 and Policy Option 2	
The wreck of an English cargo vessel from 1891 is recorded in the site, as well as records of numerous vessels and aircraft wrecks. Peat is recorded in this 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 Chesil Beach and Stennis Ledges
<p><b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b></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 (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.</p> <p><b>Management scenario 1:</b> No additional management.</p> <p><b>Management scenario 2:</b> Zones closure of areas of infralittoral rock* to bottom trawls, dredges, pots and traps, nets, hooks and lines.</p> <p><b>Management scenario 3:</b> Closure of entire rMCZ to bottom trawls and dredges.</p> <p><b>Management scenario 4:</b> Closure of entire rMCZ to bottom trawls, dredges, pots and traps, nets, hooks and lines.</p> <p>* The area of infralittoral rock covered by the zone is greater than the modelled area provided in Table 1 because the zoned area covers the Stennis Ledges which was mapped based on local knowledge and aerial photography. See Annex H7 for a map of the zone</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2
<p><b>Overview:</b> The rMCZ is situated inside the 6nm (nautical mile) limit and so is fished only by UK vessels. Activity includes scallop dredging, trawling, potting, netting and hand lining. The rMCZ is subject to a number of existing fisheries restrictions (see Annex E). In particular, there is a seasonal closure to trawlers and dredges that covers the western part of the rMCZ, and the Lyme Bay Designated Area (Fishing Restrictions) Order 2008 is situated adjacent a few kilometres to the north-west of the rMCZ. If additional restrictions on fisheries are required as a result of Special Areas of Conservation (SACs) in the area, these may also affect vessels. Lyme Bay and Torbay cSAC abuts the western end of the rMCZ, and Studland to Portland pSAC overlaps the eastern end of the rMCZ. Estimated total value of UK vessel landings from the rMCZ is £0.114m/yr.</p>	
<p><b>UK Dredges:</b> There are approximately 8 under 15 metre vessels from south Devon and Dorset, including the ports of Brixham, Lyme Regis, West Bay and Weymouth, that regularly fish in the area (Southern Inshore Fisheries</p>	<p><b>Scenario 1:</b> No impacts are anticipated under this scenario.</p> <p><b>Scenarios 2, 3 and 4:</b> Under these scenarios, the rMCZ will reduce the area of the scallop ground located off Chesil Beach. Effort displaced from inside the rMCZ is likely to be</p>

Table 2b. Commercial fisheries	rMCZ Chesil Beach and Stennis Ledges														
<p>and Conservation Authorities (IFCA), pers. comm., 2011).</p> <p>There is a significant level of dredging in the rMCZ, concentrated around the area of the Stennis Ledges. The rMCZ covers part of a dredged area which extends east along the coast, predominantly outside of the rMCZ.</p> <p>The Lyme Bay closed area has affected the distribution of dredging in the wider Lyme Bay area. Much of the effort has been displaced to grounds off Exmouth, but effort has also been displaced to the east towards Weymouth (Mangi and others, 2011)(Mangi, Gall, Hattam, Rees, &amp; Rodwell, 2011) which includes the area of the rMCZ.</p> <p>There is evidence of vessel owners affected by the Lyme Bay closed area and expected SAC management investing in larger vessels to allow them to access grounds that are further away (South West Fishing Industry Group, 2011) (South West Fishing Industry Group, 2011) (Mangi, Gall, Hattam, Rees, &amp; Rodwell, 2011) (Mangi and others, 2011).</p> <p>Estimated value of UK dredge landings from the rMCZ is £0.055m/yr.</p>	<p>redistributed to the remainder of the ground or to other grounds to the east and west. Scalloping grounds further offshore are less feasible for the vessels affected, which are all under 15 metres in length. Decisions to fish further offshore may increase risks to safety (South West Fishing Industry Group, 2011) (South West Fishing Industry Group, 2011) (scallop vessel owner, pers. comm., 2011).</p> <p>The additional restrictions of the rMCZ may encourage more fishers to invest in larger vessels or to invest in switching to alternative gear types. Investment costs may be significant (South West Fishing Industry Group, 2011) (South West Fishing Industry Group, 2011).</p> <p>The Lyme Bay closed area and expected additional fisheries management for the Lyme Bay and Torbay cSAC are already reducing the area of inshore scallop grounds available to vessels. The additional displacement of effort from the rMCZ may have knock on consequences for fishing activity outside the rMCZ. While evidence indicates that other scalloping grounds have been able to absorb displaced effort from the Lyme Bay closed area, it is uncertain whether this is likely to continue in the long term (Mangi and others, 2011) Closure of the rMCZ to dredges will add further pressure to these grounds and make their long-term sustainability less certain</p> <p>Displacement from the Lyme Bay closed area has resulted in increased gear conflict between static and mobile gear fishers (Mangi and others, 2011). Displacement from the rMCZ is likely to increase this trend .</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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.021</td><td>0.055</td><td>0.055</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.021	0.055	0.055
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4										
	Value of landings affected	0.000	0.021	0.055	0.055										
<p><b>UK Bottom trawls:</b> Otter trawls are used in the areas of softer sediment in the rMCZ. Fewer than 5 under 12 metre vessels working out of Lyme Regis, Westbay and Weymouth are known to be active in the rMCZ (Southern IFCA, pers. comm., 2011). The Lyme Bay closed area has already led to some redistribution of effort westwards (Southern IFCA, pers. comm., 2011). Some</p>	<p><b>Scenario 1:</b> No impacts are anticipated under this scenario.</p> <p><b>Scenario 2, 3 and 4:</b> Under these scenarios, the rMCZ will displace effort into other fishing grounds in Lyme Bay. This may lead to an increase in the fishing costs of affected fishers if they are displaced to grounds further from their home port. If the affected vessels choose to</p>														

Table 2b. Commercial fisheries	rMCZ Chesil Beach and Stennis Ledges				
owners are choosing to buy larger boats in order to be able to fish further from port while others are considering switching to other gear types (South West Fishing Industry Group, 2011). Estimated value of UK bottom trawl landings from the rMCZ is £0.005m/yr.	fish further offshore, this may increase risks to safety (as all the vessels are under 12 metres).				
	There is evidence of vessel owners affected by the Lyme Bay closed area and expected SAC management investing in larger vessels to allow them to access grounds that are further away (South West Fishing Industry Group, 2011) (Southern IFCA, 2011) (Mangi and others, 2011). It is possible that additional restrictions of the rMCZ may encourage more fishers to invest in larger vessels or to invest in switching to alternative gear types (South West Fishing Industry Group, 2011). Investment costs may be significant. However, given the low value of landings affected, it is unlikely that the designation of the rMCZ would significantly contribute to this trend.				
	Displacement from the Lyme Bay closed area has resulted in increased gear conflict between static and mobile gear fishers (Mangi and others, 2011). Displacement from the rMCZ may increase this trend.				
	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	0.002	0.005	0.005
<b>UK Pots and traps:</b> At least 6 vessels regularly fish within the rMCZ (Southern IFCA, pers. comm., 2012). Up to 4 under 10 metre boats fish in Chesil Cove, at the eastern end of the rMCZ. They launch their boats from the beach, fishing with short strings of pots as well as nets, and their activity is heavily weather dependent. This is the only place that they fish and a large proportion of their activity is thought to be within the eastern end of the rMCZ. (Southern IFCA, pers. comm., 2012)	<b>Scenarios 1 and 3:</b> No impacts are anticipated under these scenarios.				
Also, 2 or 3 under 12 metre vessels from Weymouth target lobster and crab. Their effort is focused on the area of the Stennis Ledges, which is particularly productive ground. At least one of these vessels fishes almost exclusively on	<b>Scenarios 2 and 4:</b> At least 6 regular vessels will be affected by the rMCZ under these scenarios. For the 2 Weymouth boats, the rMCZ is an important fishing ground and it is unclear whether they would be able to make up the lost landings from elsewhere, as grounds as productive as this one are generally already fished by other vessels (SIFCA, pers. comm., 2012).				
	For the 4 under 10 metre boats, the rMCZ will significantly impact on their continued viability. The nature of fishing and size of boat mean that viable alternatives are not available (SIFCA, pers. comm., 2012).				
	Estimated annual value of UK pot and trap landings affected is expected to fall within the				

Table 2b. Commercial fisheries		rMCZ Chesil Beach and Stennis Ledges				
the Stennis Ledges (SIFCA, pers. comm., 2012).  Estimated value of UK pots and traps landings from the rMCZ is £0.033m/yr.	following range:					
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	
	Value of landings affected	0.000	0.012	0.000	0.033	
		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.				
<b>UK Nets:</b> It is thought that up to 4 vessels from Weymouth and 2 vessels from West Bay fish with nets in the rMCZ and surrounding area. Fishers principally use trammel nets and tangle nets, targeting species including sole, plaice, turbot and brill. Netting takes place throughout the rMCZ (Southern IFCA, pers. comm., 2012). Estimated value of UK net landings from the rMCZ is £0.008m/yr.	<b>Scenarios 1 and 3:</b> No impacts are anticipated under these scenarios.					
	<b>Scenarios 2 and 4:</b> At least 4 vessels will be affected by the rMCZ under these scenarios. The rMCZ is likely to have a greater impact on the boats from Weymouth than those from West Bay (SIFCA, pers. comm., 2012).					
	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	0.004	0.000	0.008	
		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.				
<b>UK Hooks and lines:</b> A low level of fishing with hooks and lines takes place in the rMCZ, with no vessels known to regularly target the area (Southern IFCA, pers. comm., 2012). Estimated value of UK hook and line landings from the rMCZ is £0.013m/yr.	<b>Scenarios 1 and 3:</b> No impacts are anticipated under these scenarios.					
	<b>Scenarios 2 and 4:</b> As there are no regular fishers active in the rMCZ, it is considered likely that there will be no significant impacts as a result of these scenarios.					
	Estimated annual value of UK hook and line landings affected is expected to fall within the					



Table 2b. Commercial fisheries		rMCZ Chesil Beach and Stennis Ledges				
		following range:				
		<i>£m/yr</i>	Scenario 1	Scenario 2	Scenario 3	Scenario 4
		Value of landings affected	0.000	0.004	0.000	0.013
Total direct impact under Policy Option 1 and Policy Option 2						
<b><i>Total direct impact on UK commercial fisheries</i></b>		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	Scenario 4
		Value of landings affected	0.000	0.043	0.060	0.114
		GVA affected	0.000	0.021	0.028	0.056
		Best estimate				
		0.011				
		0.005				
		<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> <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>				
<b><i>Impact on non-UK commercial fisheries</i></b>		None, as the rMCZ is within 6nm.				

Table 2c. Flood and coastal erosion risk management (coastal defence)	rMCZ Chesil Beach and Stennis Ledges
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<b>Table 2c. Flood and coastal erosion risk management (coastal defence)</b>		<b>rMCZ Chesil Beach and Stennis Ledges</b>
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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).		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2</b>	
The 0 to 20 year Shoreline Management Plan policies along the shoreline of the rMCZ include 'holding the line' to protect assets at Chiswell, 'managed realignment' to the west of Chiswell and 'no active intervention' on frontage of the Fleet. The Chiswell wave return wall 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).	

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

<b>Table 3. Human activities in the site that are not negatively affected by the rMCZ under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ Chesil Beach and Stennis Ledges</b>
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

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<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 scale<sup>3</sup></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 Chesil Beach and Stennis Ledges	
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			
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓* 1	None	Maintain			
A3.1 High energy infralittoral rock	BSH	✓	✓	X	The viability target for this feature is not met	Recover			
A5.1 Subtidal coarse sediment	BSH	✓	✓	X	The viability target for this	Recover	This BSH is currently only	Only a small proportion	

<sup>3</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

					feature is not met		reaching the minimum adequacy target	(<1%) of this BSH is currently protected within existing MPAs in the FS area	
A5.2 Subtidal sand	BSH	✓	✓	X	The viability target for this feature is not met	Recover		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	✓	X	X	The viability target for this feature is not met	Recover	The viability target for this feature is not met		
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓	None	Recover		Only a small proportion of this feature is captured in existing MPAs	
Site considerations									
Connectivity			✓						
Geological/Geomorphological features of interest			✓						

## Annex I2. Site specific *Impact Assessment materials (Option 2)*

Appropriate boundary	✓
Areas of Additional Ecological Importance	X
Overlaps with existing MPAs	✓

### Additional comments and site benefits:

<sup>1</sup> The intertidal BSHs do not reach the minimum viability criteria (5km<sup>2</sup>), however due to linear nature of Chesil Beach and its intertidal habitats, they are considered viable through length only (approx 15km in length).

Stennis Ledges is an area of rugged seabed which encourages a higher variation of biodiversity/biotopes within the site.

There is anecdotal information on the additional presence of BSH High energy circalittoral rock and FOCI habitat Fragile sponge and anthozoan communities, present within the rMCZ boundary ref: DORIS Data, DWT; (Lieberknecht, et al. 2011, Dixon, et al. 1979) – Further investigation of data required, habitats may need to be added to as ENG features.

At the west end of Chesil Beach there is an inshore narrow zone of pebbles/shingle extending from the beach and a wider zone of pebbles/stones mixed with sand grading into a zone of sand and mud. A *Pagurus bernhardus*–*Maja squinado* association is found on the pebbles and sand. Large boulders at Chesil Cove support a rich hydrozoa-ascidiacea-porifera community. (SAD in (Lieberknecht, et al. 2011))

There are historic records for a species of maerl (*Lithothamnion sp.*) (Lieberknecht, et al. 2011, Dixon, et al. 1979), though no up to date point data.

A range of biotopes and associated species are found within the site boundary including: Pebbles in littoral bedrock; boulders; rocky outcrops; boulders separated by patches of sand; mud and gravel; extensive bed rock and boulders with *Laminaria hyperborea* which provides a unique habitat and substratum for many organisms and kelp forests are species rich habitats; *Nassarius reticulatus* on sand; as well as other species of hydrozoa, ascidians and porifera on all grades of rock debris.

### 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 Chesil Beach and Stennis Ledges**

Table 5a. Fish and shellfish for human consumption		rMCZ Chesil Beach and Stennis Ledges
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 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 2b.</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. 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 in the rMCZ, 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 improved habitat condition 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>A reduction in scalloping within the rMCZ as a result of new management may result in improved on-site scallop populations. If some scalloping is still permitted within the rMCZ, then fishers may benefit from improved catches within the site. If no scalloping is permitted within the rMCZ, then no on-site benefits will be derived. A healthier scallop population may result in spill-over benefits to scallop beds outside the rMCZ as a result of possible increased on-site spat production, improving catches at those scalloping grounds.</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 Chesil Beach and Stennis Ledges
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Angling:</b> 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 and unfavourable condition (see Table 1b).</p> <p>Chesil Beach is one of the most popular angling locations in the UK. Shore angling activity is concentrated at the eastern and western ends of the rMCZ, where there are access points. Some boat angling occurs off the beach. Species targeted include dogfish, pouting, scad, cod, codling, whiting, gurnard and mackerel. 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, some of the features will recover to favourable condition. Others will be maintained in favourable 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>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>Anticipated direction of change:</p> <p>↑</p> <p>Confidence : Low</p>
<p><b>Diving:</b> 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.</p> <p>There is recreational diving from the shore and from boats at a few sites in the rMCZ (although activity is concentrated outside the rMCZ at the site of the M2 submarine). 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 will be recovered to favourable condition. Others 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, 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>

Table 5b. Recreation	rMCZ Chesil Beach and Stennis Ledges	
<p><b>Wildlife watching:</b> 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.</p> <p>Boat trips will often go through the rMCZ, although the main focus of the trips is on the geology of Chesil Beach rather than the marine wildlife. From the shore, there is bird watching; however, this tends to be focused on waders and sea birds feeding on the sandflats (outside the rMCZ) and viewing of other local wildlife, as well as the wildlife of the Fleet lagoon (outside the rMCZ) and the geology of Chesil Beach. 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 of site features and any associated increase in the abundance and diversity of species 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 style="text-align: center;">↑</p> <p>Confidence : Low</p>

Table 5c. Research and education	rMCZ Chesil Beach and Stennis Ledges	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> 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 Chesil Beach, including in the marine environment. The Fleet Study Group was founded in 1975 by the Natural Environment Research Council to collect scientific and historical 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 between 15 and 20 members of the group. Portsmouth University surveyed a series of control markers on Chesil Beach and along the Fleet foreshore to act as reference locations for future studies (Chesil Bank and the Fleet Nature Reserve, 2010). It has not been possible to estimate the</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 style="text-align: center;">↑</p> <p>Confidence: High</p>



Table 5c. Research and education		rMCZ Chesil Beach and Stennis Ledges
value derived from research activities associated with the rMCZ.		
<p><b>Education:</b> Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Chesil Beach is part of the Jurassic Coast and is a popular fieldwork location. Education infrastructure is centred on the Chesil Beach Visitor Centre where much of the activity is focused on the geological feature of Chesil Beach and the Fleet lagoon (which is outside the rMCZ). In the marine environment, the centre offers audio-visual interpretations of the formation of Chesil Beach and live sea bed camera pictures (Jurassic Coast, 2008). The centre is currently being renovated to include an education room, indoor café and more exhibition space. There will also be a boardwalk to Chesil Beach, allowing easier access. The centre will offer 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 (Chesil Bank and the Fleet Nature Reserve, 2012). 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 Chesil Beach and Stennis Ledges
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen. Native oyster beds sequester carbon and filter algae and sediment from the water (Fletcher and others, 2012).</p> <p><b>Environmental resilience:</b> 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 favourable condition.</p> <p>Improved habitat condition and 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>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ Chesil Beach and Stennis Ledges
<p><b>Natural hazard protection:</b> 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>		

Table 5e. Non-use and option value		rMCZ Chesil Beach and Stennis Ledges
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 'wide range of plants and animals' because the 'whole place is amazing' and because 'it means a great deal to me personally' and 'appears unspoilt'.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

**rMCZ East of Haig Fras****Site area (km<sup>2</sup>): 399.38**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts				rMCZ East of Haig Fras
1a. Ecological description				
The south-eastern corner of the site is approximately 67km from the Land’s End peninsula. The site is an area of continental shelf, most of which is between 50 metres and 100 metres in depth. Small areas in the western end of the site dip below the 100 metre depth contour. The sea bed is characterised by coarse sediment and sand (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				
Moderate energy circalittoral rock	9.79	-	Unfavourable Condition	Recover to favourable condition
Subtidal sand	154.65	-	Unfavourable Condition	Recover to favourable condition
Subtidal coarse sediment	235.53	-	Unfavourable Condition	Recover to favourable condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.				
Subtidal coarse sediment and subtidal sand				

**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 Haig Fras				
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>						
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.						
<b>Management scenario 1:</b> No additional management.						
<b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls and dredges.						
<b>Management scenario 3:</b> Closure of entire rMCZ to bottom trawls and dredges; zoned closure of moderate energy circalittoral rock to pots and traps, nets, and hooks and lines.						
<b>Management scenario 4:</b> 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 and Policy Option 2				
<b>Overview:</b> The rMCZ is situated midway between the UK 12nm (nautical mile) limit and the UK’s 200nm fishery limit. 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 and there is a low level of long lining and hand lining by UK vessels (MCZ Fisheries Model). Estimated total value of UK vessel landings from the rMCZ: £0.049m/yr.						
<b>UK Bottom trawls:</b> 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 the International Council for the Exploration of the Sea (ICES) Rectangles 29E3 and 30E3) principally target monkfish, sole and megrim (MMO, 2011a). Estimated value of UK bottom trawl landings from the rMCZ: £0.035m/yr.		<b>Scenario 1:</b> No impacts are anticipated under Scenario 1.				
		<b>Scenarios 2, 3 and 4:</b> Under these scenarios, displaced vessels may increase their effort to the east of the rMCZ in the more heavily fished 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	Scenario 4
		Value of landings affected	0.000	0.035	0.035	0.035

Table 2a. Commercial fisheries		rMCZ East of Haig Fras			
<b>UK Nets:</b> A description of the baseline is not available for this rMCZ. Estimated value of UK net landings from the rMCZ: £0.014m/yr.	<b>Scenarios 1 and 3:</b> No impacts are anticipated under these scenarios.				
	<b>Scenarios 2 and 4:</b> A relatively low 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	Scenario 4
	Value of landings affected	0.000	0.000	0.000	0.014
	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				
<b>UK Hooks and lines:</b> There is a low level of hook and line activity in the rMCZ. Estimated value of UK hook and line landings from the rMCZ: less than £0.001m/yr.	<b>Scenarios 1 and 3:</b> No impacts are anticipated under these scenarios.				
	<b>Scenarios 2 and 4:</b> The affected value of landings is low under these scenarios, at less than £0.001m/yr, and therefore no significant impacts are anticipated.				
	Estimated annual value of UK hook and line landings affected is expected to fall within the following range:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Value of landings affected	<0.001	<0.001	<0.001	<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.				

Table 2a. Commercial fisheries		rMCZ East of Haig Fras					
Total direct impact under Policy Option 1 and Policy Option 2							
<b>Total direct impact on UK commercial fishing</b>		Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:					
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate
		Value of landings affected	0.000	0.035	0.035	0.049	0.005
		GVA affected	0.000	0.015	0.015	0.021	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.					
<b>Impact on non-UK commercial fishing:</b> Non-UK vessels using static gears, bottom trawls/dredges (in particular French otter trawlers, with lower levels of Belgian beam trawling) and mid-water trawls fish within the rMCZ (Lee, 2010). 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: £0.162m/yr; static gears: £0.000m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.		<b>Scenario 1:</b> No impacts are anticipated under Scenario 1.  <b>Scenarios 2, 3 and 4:</b> Non-UK vessels using 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 will be £0.162m/yr (bottom trawls/dredges). No information on the effect of the zoned closure to static gears or the impact on Belgian vessels' value of landings is available.					

Table 2b. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and Policy Option 2 and not for this site alone	rMCZ 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 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	pMCZ East of Haig Fras
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 scale<sup>4</sup></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 Haig Fras	
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

<sup>4</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A4.2 Moderate energy circalittoral rock	BSH	<input type="checkbox"/>	<input type="checkbox"/> * 1	<input type="checkbox"/>	None	Recover	This BSH is currently only reaching the minimum adequacy target		
A5.1 Subtidal coarse sediment	BSH	<input type="checkbox"/>	<input type="checkbox"/> * 2	<input type="checkbox"/>	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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None	Recover		Only a small proportion of this feature is captured in existing MPAs.	
Site considerations									
Connectivity				✓ * 3					
Geological/Geomorphological features of interest				✓ * 4					



## Annex I2. Site specific *Impact Assessment materials (Option 2)*

Appropriate boundary	✓
Areas of additional ecological importance	✓ * 5
Overlaps with existing MPAs	None

### Additional comments and site benefits:

- <sup>1,2</sup> Adequacy guidelines for the broad-scale habitats subtidal coarse sediment and moderate energy circalittoral rock have only just been achieved within this regional MCZ project area.
- <sup>3</sup> From an initial assessment it appears that this rMCZ is crucial for the connectivity of EUNIS Level 2 circalittoral rock and sublittoral sediment between the far offshore rMCZs and those further inshore.
- <sup>4</sup> Although not proposed as a primary feature for geology/ geomorphology in the rMCZ, the northern extent of the site has a slight overlap with a geomorphological feature, a longitudinal sedimentary bedform field.
- <sup>5</sup> 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 Haig Fras
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5a. Fish and shellfish for human consumption		rMCZ East of Haig Fras
<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, 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 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 Haig Fras
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
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 Haig Fras
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<b>Research:</b> Fletcher and others (2012) identify that the features to be protected	Monitoring of the rMCZ will help to inform understanding of how the marine	Anticipated

Table 5c. Research and education		rMCZ East of Haig Fras
<p>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>environment is changing and how it is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.</p>	<p>direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p><b>Education:</b> 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 Haig Fras
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> 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><b>Natural hazard protection:</b> As the site is offshore, it is unlikely to contribute to</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>

<b>Table 5d. Regulating services</b>		<b>rMCZ East of Haig Fras</b>
providing natural hazard protection.		
It has not been possible to estimate the value of regulating services in the site.		

<b>Table 5e. Non-use and option values</b>		<b>rMCZ East of Haig Fras</b>
<b>Baseline</b>	<b>Beneficial impact under Policy Option 1 and Policy Option 2</b>	
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 Isles of Scilly Sites<sup>5</sup>**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

**Site area (km<sup>2</sup>): 50.22**

Table 1. Conservation impacts	rMCZ Isles of Scilly Sites
<b>1a. Ecological description</b>	
<p>The Isles of Scilly Sites recommended Marine Conservation Zone (rMCZ) consists of 11 spatially separate areas. The boundaries of the sites, as presented in the MCZ Recommendations Report, mostly follow contour lines for ease of navigation (generally the 50 metre depth contour and mean high water springs). (It should be noted that, since the recommendations were submitted, the Isles of Scilly Local Group has suggested amending the boundaries so that they are straight, in line with the advice in the Ecological Network Guidance (Natural England, pers. comm., 2012).) Of the 11 areas that make up rMCZ Isles of Scilly Sites, 10 overlap with Sites of Special Scientific Interest and the Isles of Scilly Complex Special Area of Conservation.</p>	
<p>The areas within this rMCZ range in depth from sea level to approximately 70 metres. They largely cover high and moderate energy infralittoral rock, and moderate energy circalittoral rock. They also include some patches of subtidal coarse sediment and subtidal mixed sediments, and subtidal macrophyte-dominated sediment (which coincide with the Features of Conservation Importance (FOCI) habitat seagrass beds). A diverse range of intertidal habitats are also present within these areas.</p>	
<p>The Isles of Scilly have been well-studied for their intertidal and shallow sublittoral biota and are considered to be exceptionally rich in biodiversity, as well as representative of exceptionally high quality examples of a range of habitats. There is a large range of FOCI that occur in the Isles of Scilly.</p>	
<p>The primary FOCI habitats are fragile sponge and anthozoan communities, and seagrass beds, but there are records of others including intertidal underboulder communities and the only records of tide-swept communities in the South-West. These habitats support a large range of FOCI species, including <i>Eunicella verrucosa</i>, <i>Leptopsammia pruvoti</i>, <i>Palinurus elephas</i>, <i>Gobius cobitis</i> and <i>Lucernariopsis campanulata</i>, as well as areas of importance for seahorses. There are many reports in the scientific and survey literature of records of FOCI species and habitats within the Isles of Scilly.</p>	
<p>Extensive subtidal and intertidal sandy sediments occur between the islands. These sandbanks are particularly important due to their extent and associated communities,</p>	

<sup>5</sup> Recommended MCZ Isles of Scilly Sites is comprised of 11 different rMCZs which have been put forward as a group by the Isles of Scilly Local Group (Finding Sanctuary): Bishop to Crim, Bristows to the Stones, Gilstone to Gorregan, Hanjague to Deep Ledge, Higher Town, Lower Ridge to Innisvoul, Men a Vaur to White Island, Peninnis to Dry Ledge, Plympton to Spanish Ledge, Smith Sound Tide-swept Channel and Tean.

Annex I2. Site specific *Impact Assessment materials (Option 2)*

which are very specific due in part to the combination of sheltered conditions, mild climate, constant salinity and low silt conditions. The latter are primarily a result of the oceanic nature of the surrounding seas, which have a low suspended sediment concentration and a lack of any major riverine input. These factors provide ideal conditions for some of the most extensive and diverse beds of seagrass *Zostera marina* found in the UK. Extensive sediment areas occur in the Isles of Scilly, including in the rMCZs, and support rich intertidal communities. The Isles of Scilly also have a high diversity of seaweeds.

There is hard bedrock reef, both infralittoral and circalittoral, in some cases extending to depths well beyond 50 metres. Exposure levels vary: some reefs are very exposed, others sheltered. The topographic complexity of the reefs is low. The south-westerly position of the islands leads to a range of warm water species being present, including sunset cup coral *Leptopsammia pruvoti*, pink sea-fan *Eunicella verrucosa*, and Weymouth carpet-coral *Hoplania durotrix* (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	4.11	Not available	Unfavourable/ Favourable Condition	Recover to/ Maintained at Favourable Condition
High energy circalittoral rock	0.49	Not available	Unfavourable/ Favourable Condition	Recover to/ Maintained at Favourable Condition
Moderate energy circalittoral rock	19.81	Not available	Unfavourable/ Favourable Condition	Recover to/ Maintained at Favourable Condition
Moderate energy infralittoral rock	14.6	Not available	Unfavourable/ Favourable Condition	Recover to/ Maintained at Favourable Condition
Subtidal coarse sediment	1.76	Not available	Favourable Condition	Maintained at Favourable Condition
Subtidal macrophyte-dominated sediment	0.66	Not available	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	1.62	Not available	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	Not available	Not available	Favourable Condition	Maintained at Favourable Condition

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Low energy intertidal rock	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
Peat and clay exposures	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Tide-swept channel	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Fragile sponge and anthozoan communities on subtidal rocky habitats	Not available	Not available	Unfavourable/ Favourable Condition	Recover to/ Maintained at Favourable Condition
Seagrass beds	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
Amphianthus dohrnii	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Arctica islandica	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Cruoria cruoiaeormis	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Gobius cobitis	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Grateloupia montagnei	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Halicystus auricula	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Lucernariopsis campanulata	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Lucernariopsis cruxmelitensis	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
Palinurus elephas	Not available	Not available	Unfavourable Condition	Recover to Favourable Condition
Paludinella littorina	Not available	Not available	Favourable Condition	Maintained at Favourable Condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below				

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

<b>Table 2a. Archaeological heritage</b>		<b>rMCZs Isles of Scilly Sites</b>
<b>Source of costs of the rMCZs under Policy Option 1 and Policy Option 2</b>		
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 rMCZs 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.		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZs on the sector under Policy Option 1 and Policy Option 2</b>	
There are 12 wrecks throughout these sites including one historic shipwreck designated under the Protection of Wrecks Act 1973 (Tearing Ledge Wreck). There are around 123 records of items of archaeological significance in the rMCZs ranging from buildings and field systems to artefacts. 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).	<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 these rMCZs 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).</p> <p>If archaeologists respond to restrictions on excavation in areas of peat and clay exposures 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. If archaeological excavations do not take place as a result this will prevent interpretation of archaeological evidence from the site which will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.</p>	

<b>Table 2b. Commercial fisheries</b>	<b>rMCZs Isles of Scilly Sites</b>
<b>Source of costs of the rMCZs under Policy Option 1 and Policy Option 2</b>	
<b>Management scenario 1 (Finding Sanctuary Steering Group recommendation):</b>	



Table 2b. Commercial fisheries		rMCZs Isles of Scilly Sites				
<ul style="list-style-type: none"><li>• Closure of all rMCZs to bottom trawls and dredges.</li><li>• Three-month seasonal closure (22 December to 22 March) for all commercial fishing in all rMCZs.</li><li>• Closure of all rMCZs to commercial sand eel fishing.</li><li>• Recording zone, in rMCZ Gugh Reef.</li><li>• Closure of non-disturbance zones to all commercial fishing, in rMCZs Smith Sound and Tean.</li></ul> <p>No additional management scenarios have been considered for these rMCZs as the site was put forward by the Finding Sanctuary Steering Group with these specific management recommendations, which were developed by the Isles of Scilly Local Group during the Finding Sanctuary planning process.</p>						
Baseline description of activity	Costs of impact of rMCZs on the sector under Policy Option 1 and Policy Option 2					
<p><b>Overview:</b> There are a number of commercial fishing restrictions already in existence around the Isles of Scilly (see Annex E). The rMCZs are all within 6nm (nautical miles) and so are fished only by UK vessels. All of the Isles of Scilly rMCZs, with the exception of Bristows to the Stones, are within 1nm of the islands. Static gear is used at varying intensities throughout the Isles of Scilly rMCZs, with potting accounting for the majority of the effort. There is a commercial fishing fleet of 18 vessels based at the Isles of Scilly (MMO, 2010). There are no trawling vessels currently based in the islands, with the last one having left the fleet a few years ago (Isles of Scilly Fishermen’s Association, pers. comm., 2011). The Isles of Scilly vessels operate a single static gear or a mix of static gears. The local fleet are all day boats, typically less than 10 metres in length, and fish in and around the islands, generally no more than 6 or 7nm from shore (Isles of Scilly Fishermen’s Association, pers. comm., 2011). Estimated total value of UK vessel landings from the rMCZs: £0.042m/yr.</p>						
<p><b>UK Dredges:</b> Scallop dredging does not occur in and around the islands. There is anecdotal evidence of occasional activity over the Bristows to the Stones rMCZ to the north-east of the islands, although current activity is thought to be limited. Estimated value of UK dredge landings from the rMCZ: less than £0.001m/yr.</p>	<p><b>Scenario 1:</b> Given the very low level of activity, no significant impacts are expected. Estimated annual value of UK dredge landings affected:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>&lt;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					
<p><b>UK Bottom trawls:</b> Trawling does not occur close to the islands. The last local trawler left the fleet a few years ago (Isles of Scilly Fishermen’s Association, pers. comm., 2011). There is evidence of occasional activity over the Bristows to the Stones rMCZ to the north-east of the islands, although current activity is thought to be limited. Estimated value of UK bottom trawl landings from the rMCZ: £0.001m/yr.</p>	<p><b>Scenario 1:</b> Given the very low level of activity, no significant impacts are expected. Estimated annual value of UK bottom trawl landings affected:</p> <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					

Table 2b. Commercial fisheries	rMCZs Isles of Scilly Sites
<p><b>UK Pots and traps:</b> Potting occurs throughout the Isles of Scilly and in most of the rMCZs (Isles of Scilly Vulnerability Assessment, 2011). It is the main gear used by the local fleet, primarily targeting lobster and crab. The majority of fishers do not fish during the winter months when the weather limits the number of available fishing days (Isles of Scilly Fishermen's Association, pers. comm., 2011). Estimated value of landings from the rMCZs: £0.035m/yr.</p> <p>A number of residents own small numbers of pots that they use on a recreational basis (Isles of Scilly Inland Fisheries and Conservation Authority [IFCA], pers. comm., 2011). Fishing generally only occurs during the summer.</p>	<p><b>Scenario 1:</b> The low level of activity during the winter means that the three-month winter closure will have a limited effect on the fishing activity of most fishers who employ pots and traps. For fishers who remain active part-time during the winter the closure will affect their part-time income. It has not been possible to estimate landing values from the three-month winter closure, although stakeholders have indicated that the impact is not likely to be significant (Isles of Scilly Fishermen's Association, pers. comm., 2010).</p>
<p><b>UK Netting:</b> Netting using tangle nets and gill nets occurs throughout the islands, including in six of the individual Isles of Scilly rMCZs (Isles of Scilly Vulnerability Assessment, 2011). Key target species include turbot and brill. Netting is principally by the local fleet; however, netters from mainland ports such as Newlyn occasionally fish in the area (Isles of Scilly Fishermen's Association, pers. comm., 2010). The majority of local fishers do not fish during the winter months when the weather limits the number of available fishing days (Isles of Scilly Fishermen's Association, pers. comm., 2010). Estimated value of UK net landings from the rMCZs: £0.005m/yr.</p>	<p><b>Scenario 1:</b> The low level of activity during the winter means that the three-month winter closure will have a limited effect on the activity of most fishers. However, for fishers who remain active part-time during the winter the closure will affect their part-time income. It has not been possible to estimate landing values from the three-month winter closure, although opinion is that the impact is not likely to be significant (Isles of Scilly Fishermen's Association, pers. comm., 2010).</p>
<p><b>UK Hooks and lines:</b> Hand lining occurs in a number of areas around the Isles of Scilly, although limited effort is concentrated in the rMCZs (Isles of Scilly IFCA, pers. comm., 2011). The main target species is pollack. The majority of local fishers do not fish during the winter months when the weather limits the number of available fishing days (Isles of Scilly Fishermen's Association, pers. comm., 2011). Estimated value of UK hook and line landings from the rMCZs: £0.001m/yr.</p>	<p><b>Scenario 1:</b> The low level of activity during the winter means that the three-month winter closure will have a limited effect on the activity of most fishers. However, for fishers who remain active part-time during the winter the closure will affect their part-time income. It has not been possible to estimate landing values for the three-month winter closure, although opinion is that the impact is not likely to be significant (Isles of Scilly Fishermen's Association, pers. comm., 2010).</p>
<b>Total direct impact under Policy Option 1 and Policy Option 2</b>	

Table 2b. Commercial fisheries		rMCZs Isles of Scilly Sites	
<b><i>Total direct impact on UK commercial fishing</i></b>	Estimated annual value of UK vessel landings and gross value added (GVA) affected:		
	<i>£m/yr</i>	Scenario 1	Best estimate
	Value of landings affected	0.001	<0.000
	GVA affected	0.000	<0.000
	Note that these figures are an underestimate as they do not include values for the seasonal closure of the sites to pots and traps, nets, and hooks and lines.  The best estimate is based on an assumption of 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 is likely to be an underestimate due as it does not include values for the seasonal closure of the sites to pots and traps, nets, and hooks and lines.		
<b><i>Impact on non-UK commercial fishing</i></b>	None.		

Table 2c. Flood and coastal erosion risk management (coastal defence)		rMCZs Isles of Scilly Sites
<b>Source of costs of the rMCZs under Policy Option 1 and Policy Option 2</b>		
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 rMCZs will be needed relative to the mitigation provided in the baseline).		
Baseline description of activity	Costs of impact of rMCZs on the sector under Policy Option 1 and Policy Option 2	
Extensive coastal change pressures occur at the Isles of Scilly and the 0 to 20 year Shoreline Management Plan (SMP) policies include a complex array of options specific to local risks. Schemes may come forward along the shoreline of the rMCZs as a result of the SMP policies (Environment Agency, pers. comm., 2012).	As a result of the rMCZs, 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 2c. Flood and coastal erosion risk management (coastal defence)	rMCZs Isles of Scilly Sites
	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	rMCZs Isles of Scilly Sites
<p><b>Source of costs of the rMCZs under Policy Option 1 and Policy Option 2</b></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 rMCZs.</p>	
Baseline description of activity	Costs of impact of rMCZs on the sector under Policy Option 1 and Policy Option 2
MOD is known to make use of the rMCZs for aerial, surface and water column activities. The rMCZs are in an MOD exercise area.	It is not known whether the rMCZs 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 these rMCZs alone).

Table 2e. Ports, harbours, shipping and disposal sites	rMCZs Isles of Scilly Sites
<p><b>Source of costs of the rMCZs under Policy Option 1 and Policy Option 2</b></p> <p><b>Management scenario 1:</b></p> <ul style="list-style-type: none"> <li>(a) 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.</li> <li>(b) Anchoring Restrictions (on vessels over 10 metres) (within pMCZs Hanjague to Deep Ledge, Higher Town, Lower Ridge to Innisvoulis and Plympton to Spanish Ledge) and Control of Future Mooring Expansions (within pMCZs Higher Town and Lower Ridge to Innisvoulis)</li> </ul> <p><b>Management scenario 2:</b></p> <ul style="list-style-type: none"> <li>(a) Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to unknown potential future port and</li> </ul>	

Table 2e. Ports, harbours, shipping and disposal sites		rMCZs Isles of Scilly Sites	
<p>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.</p> <p>(b) Anchoring Restrictions (on vessels over 10 metres) (within pMCZs Hanjague to Deep Ledge, Higher Town, Lower Ridge to Innisvouls and Plympton to Spanish Ledge) and Control of Future Mooring Expansions (within pMCZs Higher Town and Lower Ridge to Innisvouls)</p>			
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2		
<p><i>Harbour development:</i> St. Mary’s Harbour is situated within 1km of at least one of the Irlses of Scilly rMCZs. There are no known plans for developments at the harbour.</p> <p><i>Anchoring and Moorings:</i> there is currently no anchoring of vessels over 10 metres in any of the listed rMCZs, and no existing plans to expand the provision of moorings.</p>	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0	<0.001*
<p>*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.</p> <p><b>Scenario 1:</b> No costs are anticipated under scenario 1.</p> <p><b>Scenario 2:</b> 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	rMCZs Isles of Scilly Sites
Source of costs of the rMCZs under Policy Option 1 and Policy Option 2	
<p><b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for licence applications (it is not anticipated that any additional mitigation of impacts on</p>	

Table 2f. Renewable energy		rMCZs Isles of Scilly Sites		
features protected by the rMCZs will be needed relative to the mitigation provided in the baseline).				
<b>Management scenario 2:</b> 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 rMCZs on the sector under Policy Option 1 and Policy Option 2			
<b>Wave energy:</b> The rMCZs overlap with the Isles of Scilly wave energy Potential Development Area (PDA). Any likely installation in the Isles of Scilly PDA could have a footprint within the PDA of 40km <sup>2</sup> , covering 1.6% of the PDA (PMSS, 2010). The rMCZs cover 3.2% of the PDA. However, the rMCZs are not located in areas likely to be appropriate for wave energy installations (Council of the Isles of Scilly, pers. comm., 2011). As the location of the potential installation is not known, the possible overlap of export cables with the rMCZs are 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, pers. comm., 2011). The development in the PDA is expected to have a production capacity of 400MW by 2030 (PMSS, 2010).	<b>Wave energy:</b> The estimated cost to wave energy developers of these rMCZs is expected to fall within the following range of scenarios:			
	£m (one-off cost)	Scenario 1	Scenario 2	Best estimate
	Cost to the operator	0.018	At least 0.018	0.017
	<b>Scenario 1:</b> 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 rMCZs 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 rMCZs and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.018m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex N for details).			
	<b>Scenario 2:</b> 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 rMCZs, 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 14 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.				

Table 2g. Other impacts that are assessed for the suite of MCZs under Policy Option 1 and Policy Option 2 and not for this site alone	rMCZs Isles of Scilly Sites
<b>Cables (interconnectors and telecom cables):</b> 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 rMCZs (over 2013 to 2032 inclusive)

Table 3. Human activities in the site that are not negatively affected by the rMCZs under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZs Isles of Scilly Sites
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

**(NOTE:** The Isles of Scilly sites rMCZ consists of 11 spatially separate areas. Two of the 11 areas (Smith Sound Tide-Swept Channel and Tean) contain a suggested 'non-ground disturbance site', where the Local Group have suggested higher levels of restriction of human activities than in the remaining areas (Lieberknecht, et al. 2011). It was agreed at the local group level (Isles of Scilly local group meeting 27 April 2011, minutes taken by Isles of Scilly IFCA secretariat), that the fishermen should reserve the right to hand line within these sites. This refers mainly to the recreational activity of hand line fishing, and although the level of commercial hand lining is not clear from the minutes, the occurrence and impact of all hand line activity is reported to be minimal. Continuation of this minimal activity is therefore important for stakeholder support of the "higher level restrictions.)

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<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 scale<sup>6</sup></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>									rMCZs Isles of Scilly Sites
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	✓	✓	✓ * 1	The Bristows to the Stones area does not meet the ENG target for viability	Maintain		I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity (Natural England 2010d) pg 54.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.
A4.1 High energy circalittoral rock	BSH	✓	✓	✓ * 1	The Bristows to the Stones area does not meet the ENG target for viability	Maintain		I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.

<sup>6</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs



Annex I2. Site specific *Impact Assessment materials (Option 2)*

A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓ * 1	The Bristows to the Stones area does not meet the ENG target for viability	Maintain		I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.
A3.2 Moderate energy infralittoral rock	BSH	✓	✓	✓ * 1	The Bristows to the Stones area does not meet the ENG target for viability	Maintain		I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.
A5.1 Subtidal coarse sediment	BSH	✓	✓	✓ * 1	The Bristows to the Stones area does not meet the ENG target for viability	Maintain			
A5.4 Subtidal mixed sediments	BSH	✓	✓	✓ * 1	The Bristows to the Stones area does not meet the ENG target for viability	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A5.5 Subtidal macrophyte-dominated sediment	BSH	✓	✓ * 6	✓ * 1	None	Maintain		In I of Sc, these features are particularly important due to their extent, and associated communities (Jackson, et al. 2011).	In I of Sc, these features are particularly important due to their extent, and associated communities.
A5.2 Subtidal sand	BSH	✓	✓	✓ * 1	None	Maintain		In I of Sc, these features are particularly important due to their extent, and associated communities.	In I of Sc, these features are particularly important due to their extent, and associated communities.
A1.1 High energy intertidal rock	BSH	✓	✓	✓	None	Maintain		I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain		I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A2.3 Intertidal mud	BSH	✓	✓	✓	None	Maintain	Unlikely to be present here.		
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓	None	Maintain			
Fragile sponge and anthozoan communities on subtidal rocky habitat	FOCI habitat	✓	✓	✓	None	Maintain		I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.
Intertidal underboulder communities	FOCI Habitat	✓	✓	✓	None	Maintain		I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.
Seagrass beds	FOCI Habitat	✓	✓	✓	None	Maintain		In I of Sc, these features are particularly important due to their extent, and associated communities (Jackson, et al. 2011).	In I of Sc, these features are particularly important due to their extent, and associated communities.

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Tide-swept channels	FOCI Habitat	✓ * 2	✓	✓	None	Maintain	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.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.	I of Sc are regionally and nationally unique, due to their exceptionally rich biodiversity.
Peat and clay exposures	FOCI Habitat	X	X	✓	Only replicate within region	Maintain	This has not met ENG guidelines for replication, however the feature has a limited regional distribution.	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.
Pink sea-fan <i>Eunicella verrucosa</i>	FOCI Species	✓	✓	✓	The Bristows to the Stones area does not meet the ENG guidelines for viability	Maintain			This feature has a limited national distribution.

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Spiny lobster <i>Palinurus elephas</i>	FOCI Species	✓	✓	✓	The Bristows to the Stones area does not meet the ENG guidelines for viability	Recover	This feature is not protected in any existing MPAs within the SW region. This FOCI is currently only reaching the minimum replication target.	There is evidence that <i>Palinurus elephas</i> is in unfavourable condition in all SW waters (Goñi and Latrouite 2005).	There is evidence that <i>Palinurus elephas</i> is in unfavourable condition in all SW waters. It has a limited distribution nationally.
Stalked jellyfish <i>Haliclystus auricula</i>	FOCI Species	✓	✓	✓	None	Maintain	This feature is not protected in any existing MPAs within the SW region		
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. This has not met ENG guidelines for replication, however the feature has a limited regional distribution.	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Stalked jellyfish <i>Lucernariopsis cruxmelitensis</i>	FOCI Species	✓	✓	✓	None	Maintain	<p>This feature is not protected in any existing MPAs within the SW region.</p> <p>This FOCI is currently only reaching the minimum replication target.</p>	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.
Sea-fan anemone <i>Amphianthus dohrnii</i>	FOCI Species	✓	✓	✓	None	Maintain	<p>This FOCI is currently only reaching the minimum replication target.</p>	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.
Defolin's lagoon snail <i>Caecum armoricum</i> * 13	FOCI Species	✓ * 2	✓	✓	None	Maintain	<p>Only replicate within region, yet unlikely to exist in I of Sc.</p>	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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.
Sea snail <i>Paludinella littorina</i>	FOCI Species	✓	✓	✓	None	Maintain			Rare / limited distribution at UK level.
Burgundy maerl paint weed <i>Cruoria cruoriaeformis</i>	FOCI Species	✓ * 2	✓	✓	One of only two replicates within national network	Maintain	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 site is critical to replication guidelines.	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Sunset cup coral <i>Leptopsammia pruvoti</i>	FOCI Species	✓	✓	✓	None	Maintain		Rare / limited distribution at MCZ and UK level (K. Hiscock 2011)	Rare / limited distribution at MCZ and UK level. There are no records of this feature outside of the south-west (www.marlin.ac.uk, 2012).
Site considerations									
Connectivity				✓ * <sup>3</sup>					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * <sup>4</sup>					
Overlaps with existing MPAs				✓ * <sup>5</sup>					

**Additional comments and site benefits:**

<sup>1</sup> Viability for the Subtidal BSH listed above is dependent on a minimum diameter (5km). Individually, the sites in Isles of Scilly do not meet this, however the mosaic of 11 spatially separated areas which are embedded in the Isles of Scilly SAC (with the exception of the Bristows to the Stones area), as a collective, are considered to be ecologically viable (using Natural England expert opinion). The sites are highly unique and the Isles of Scilly are ecologically distinct and geographically separated from the UK mainland. (Lieberknecht, et al. 2011)

<sup>2</sup> Replication has not been met for FOCI habitat Tide-swept channels, and FOCI species *Caecum armoricum* and *Cruoria cruoriaeformis*. However, none of these can be met as features are not present in any other locations, so the target is met.

<sup>3</sup> The Isles of Scilly are important in meeting connectivity criteria in the Finding Sanctuary regional MCZ project Area.

<sup>4</sup> Due to their geographical location and the oceanic nature of the surrounding seas, the Isles of Scilly is an area of high productivity and exceptional biodiversity (Lieberknecht, et al. 2011)



<sup>5</sup> The Isles of Scilly rMCZ sites, all lie within the existing Isles of Scilly marine SAC. There is scientific value as there has been considerable research on the marine environment.

The Isles of Scilly also support a population of grey seals (Sayer, et al. (In press)), and significant numbers of sea birds, which both rely on a healthy marine environment for feeding.

<sup>6</sup> The ENG ((Natural England and the Joint Nature Conservation Committee 2010) Table 6) lists BSH for which replication, viability and connectivity guidelines will be used to meet the principles of adequacy, and that all of these (except BSH Deep-sea bed) should be assessed through assigned component FOCI habitats. For BSH Subtidal macrophyte-dominated sediment, this is seagrass beds. Replication, viability and adequacy are met for this component FOCI habitat.

The Isles of Scilly sites rMCZ is unique, as it is well supported by local stakeholders, contributes to many ENG guidelines, and covers areas of reef (Irving and Northen 2012 in press) habitat that are of exceptional quality. (SAD in (Lieberknecht, et al. 2011)).

The site includes the only south-west records of tide-swept (Gall 2011) communities.

The Isles of Scilly provide ideal conditions for some of the most extensive and diverse beds of seagrass beds *Zostera marina* found in the UK ((Jackson, et al. 2011)).

These BSH and FOCI habitats support a large range of FOCI species and areas of importance for sea horses. Both species of seahorse (*Hippocampus hippocampus* and *Hippocampus guttulatus*) are found in the Isles of Scilly (SAD in (Lieberknecht, et al. 2011)).

The Isles of Scilly also has a high diversity of seaweeds; probably about 40% of UK seaweed total (Brodie, et al. 2007).

There are records of the FOCI *Grateloupia montagnei* within the Isles of Scilly sites (Smith Sound Tide-Swept Channel).

The south-westerly position of the islands leads to a range of warm water species being present (SAD in (Lieberknecht, et al. 2011)).

The Isles of Scilly's have been well studied for their intertidal and shallow sublittoral biota, and are considered to be exceptionally rich in biodiversity, as well as representative of exceptionally high-quality examples of a range of habitats (SAD in (Lieberknecht, et al. 2011)).

The largest concentration of records of the stalked jellyfish *Lucernariopsis campanulata* are found in the Isles of Scilly (SAD in (Lieberknecht, et al. 2011)).

There is strong evidence underpinning the site recommendations, primarily due to a combination of historical data and recent evidence supplied by the Isles of Scilly Wildlife Trust, including photographic records, which accompany the Final Recommendations (Lieberknecht, et al. 2011).

*Palinurus elephas*, *Gobius cobitis* and *Halicystus auricula*: These features are not protected in any existing MPAs within the SW region, therefore, MCZ designation is needed to meet the minimum ENG guidelines for replication.

### 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 Isles of Scilly Sites
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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). Seagrass beds within the rMCZ provide important nursery areas for flatfish (Joint Nature Conservation Committee, 2011) and, as such, the rMCZ is likely to help to support potential on-site and off-site fisheries. 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 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, some of the features 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, 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. Crawfish stocks may also improve. As fishing with static gears will be permitted for most of the year in the majority of the area covered by the rMCZ, some on-site benefits may occur, as well as potential off-site 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 Isles of Scilly Sites
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Angling:</b> 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 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 several companies that provide boats which can be chartered for angling, which take visitors out on the reefs, or for sharking. Species caught include pollack, wrasse, mackerel, bull huss and conger. 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, some of the features will be recovered to favourable condition. Others will be maintained in favourable condition.</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><b>Diving:</b> 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>The Isles of Scilly are known as one of the best places for diving around the British Isles due to the excellent underwater visibility and nutrient-rich sea water. There are several diving companies that provide beginner and advanced courses. Divers can experience large underwater rock formations, reef walls and shipwrecks, and have the opportunity to swim among grey seals. 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 will be recovered to favourable condition. Others 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 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 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><b>Wildlife watching:</b> Fletcher and others (2012) identify that 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>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 of site features and any associated increase in abundance and diversity of species that are visible to wildlife</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5b. Recreation	rMCZ Isles of Scilly Sites	
<p>The Isles of Scilly are famous for being Europe's top location for seeing rare and migrant birds. Bird watchers can see wryneck, bluethroat, pectoral sandpiper, common rosefinch, ortolan, snow and Lapland bunting, jack snipe, rose-coloured starling and spotted crane. Grey seals are also draw wildlife watchers. There are small companies that offer specialised bird watching and wildlife watching tours and accommodation is available on all of the inhabited islands. Wildlife watching boat trips leave from St Mary's to visit Annet – an uninhabited island that is a bird sanctuary and is famous for its breeding puffins – and other popular breeding and feeding grounds for sea birds. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p>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>Confidence: Low</p>

Table 5c. Research and education	rMCZ Isles of Scilly Sites	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> 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>Significant levels of environmental and conservation research activities take place on the Isles of Scilly. A number of papers are cited in Lieberknecht and others (2012) on which the ecological description in Table 1a was based. A number of marine research initiatives have enhanced baseline information and are set out in the Area of Outstanding Natural Beauty (AONB) Management Plan and are required as a result of existing environmental designations and local heritage (Isles of Scilly AONB Unit, 2010). Examples of recent research include the Isles of Scilly Marine Biodiversity Audit 2008, and underwater camera surveys of the Special Area of Conservation reef habitat. Sea birds have the longest-running biodiversity datasets on the islands, with over 30 years of data collected (Isles of Scilly AONB Unit, 2010). It has not been possible to estimate the value derived from research activities associated with</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 Isles of Scilly Sites
the rMCZ.		
<p><b>Education:</b> 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 Isles of Scilly Wildlife Trust conducts educational projects, including working with school groups. AONB ran a programme of 'enrichment sessions' while RSPB has produced a series of events with the local education authority as part of the 'after-school club to promote wildlife awareness'. Hard copy and electronic interpretation material, public events and walks are provided by a wide range of environmental and conservation organisations. The Isles of Scilly AONB Management Plan seeks to further improve the islands' education services through an interpretation strategy (Isles of Scilly AONB Unit, 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 Isles of Scilly Sites
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> 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, 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>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ Isles of Scilly Sites
<p><b>Natural hazard protection:</b> 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>	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).	

Table 5e. Non-use and option values		rMCZ Isles of Scilly Sites
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
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 personal affiliation with the area and a desire to protect the marine wildlife, including sea bed species and habitats, and large megafauna (‘It would be great to see the below-water wildlife get the same care and protection that the land-based wildlife gets in order to preserve these amazing habitats’). Voters wanted to safeguard the local area from possible future impacts (‘Please help to save this fabulous environment before it is irrevocably damaged’). The aesthetic value of the area was highlighted by a number of voters, as was an emotional attachment to the site.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>



**rMCZ Padstow Bay and Surrounds****Site area (km<sup>2</sup>): 91.87**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013<sup>7</sup>.

Table 1. Conservation impacts	rMCZ Padstow Bay and Surrounds
1a. Ecological description	
<p>The site extends around a stretch of coastline that is characterised by exposed cliffs and sandy wave-exposed bays, including the entrance to the Camel Estuary (beyond the Doom Bar). The site extends from the shoreline to approximately 50 metres of depth. Rocky habitat is present within the subtidal portion of the site. The recommended Marine Conservation Zone (rMCZ) intersects with an area of higher than average benthic species and habitat diversity (within the South-West context). Anecdotal evidence indicates that tide-swept biotopes, estuarine rocky habitats and blue mussel beds are also present in this area. The Pentire Peninsula Site of Special Scientific Interest is a coastal site, protecting sea bird colonies; the rMCZ boundary is an extension to this, covering a sea bird feeding and loafing area.</p> <p>Most of the coast consists of a flat sand plain or gentle slope extending into shallow water with rock outcrops and broken reefs; most rock surfaces have a covering of sediment. Off the headlands, stable and often very broken bedrock extends into deeper water. Sand is important to the structure of sublittoral communities, except at headlands. Communities at The Bull near Trevoze Head have been identified as distinctly different, with dense populations of <i>Mytilus edulis</i>, <i>Dendrodoa grossularia</i> and <i>Maia squinado</i>.</p> <p>At Trevone there are extensive rocky shores which have been considered sites of primary marine biological importance; these are the most extensive rocky shores on the north Cornwall coast. Newtrain Bay, Trevone has a series of irregular rocky reefs that support rich littoral communities. Mid-shore habitats are mussel/barnacle/limpet-dominated and the limpet <i>Patella aspersa</i> (now <i>Patella ulyssiponensis</i>) is particularly abundant. An unusual feature of the site is a zone of the brown alga <i>Cystoseira tamariscifolia</i> at low water. A population of the Mediterranean hermit crab <i>Clibanarius erythropus</i> was present but has not been seen following the oil pollution from the <i>Torrey Canyon</i> in 1968.</p> <p>Rocks surveyed in the Padstow area are dominated by algae to about 13 metres but kelp is restricted to shallow water (generally &lt;3 metres). Circalittoral communities include several southern species but a low variety of species is generally present. Characteristic species include <i>Pentapora foliacea</i>, <i>Stolonica socialis</i>, <i>Alcyonidium gelatinosum</i>, <i>Eunicella verrucosa</i> and <i>Marthasterias glacialis</i> (Lieberknecht and others, 2011).</p>	

<sup>7</sup> Based on SNCB advice, the management costs of fisheries changed from that established by the Regional Projects. This change are reflected under Policy Option 2.



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

Table 1. Conservation impacts			rMCZ Padstow Bay and Surrounds	
<i>Fratercula arctica</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Alca torda</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Rissa tridactyla</i>	-	-	Favourable Condition	Maintained at Favourable Condition

**Option 2:** This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.

High energy intertidal rock, Pink sea fan (*Eunicella verrucosa*, Spiny Lobster (*Palinurus elephas*)

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

Table 2a. Archaeological heritage		rMCZ Padstow Bay and Surrounds
<b>Source of costs of the rMCZ</b>		
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 Options 1 and 2	
Cliff castle at Winecove Point and inscribed stones are recorded in the area, although it is not clear if these are located in the site. There are records of other items of archaeological interest in the site. Peat is recorded here. English Heritage has indicated that this site is likely to be of interest for archaeological excavation in the future as it is relevant to its National Heritage Protection Plan (theme 3A1.2) (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost of one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.	

Table 2b. Commercial fisheries		rMCZ Padstow Bay and Surrounds		
<b>Source of costs of the rMCZ under Policy Option 1</b>				
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.				
<b>Management scenario 1:</b> No additional management.				
<b>Management scenario 2:</b> No removal of crawfish ( <i>Palinurus elephas</i> ) from the rMCZ.				
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1		
<b>Overview:</b> The rMCZ is located on the North Cornwall coast and a number of fishing restrictions already apply (see Annex E). There is a fishing fleet of over 20 vessels based at Padstow Harbour, nearly all of which are day-boat potters, although many operate multiple gear types, typically nets and pots (Cornwall SFC, 2010). The area of the rMCZ is worked primarily by potters from Newquay, Padstow and Port Isaac (Cornwall Inshore Fisheries and Conservation Authority (IFCA), pers. comm., 2010). The ground is generally too hard for bottom trawling and scalloping and there are better grounds to the west of the rMCZ, although some bottom trawling does occur in the site.				
Estimated total value of UK vessel landings from the rMCZ: £0.079m/yr.				
<b>UK Pots and traps:</b> Potters, primarily from Newquay, Padstow and Port Isaac, work throughout the rMCZ. Their vessels are typically day boats, and they may also fish with nets (Cornwall SFC, 2010). Potters typically target lobster, brown crab and spider crab.		<b>Scenario 1:</b> No impacts are anticipated under Scenario 1.		
Estimated value of UK pot and trap landings from the rMCZ: £0.030m/yr.		<b>Scenario 2:</b> Crawfish are not a target species of potters active within the rMCZ and the affected value of landings is low. Therefore no significant impacts are anticipated. It should be noted however that due to their high value, they can make up a significant proportion of a day's fishing income when they are caught.		
Potters do not target crawfish, but these are occasionally caught as bycatch (Finding Sanctuary Vulnerability Assessment, 2011). The high value fetched for crawfish means that, when caught, they can make an important contribution to a fisher's income (Potter, pers. comm., 2011). The value of crawfish landings by potters from the International Council for the Exploration of the Sea (ICES) Rectangles (30E4 and 30E5) that cover the rMCZ averages £0.002m/yr (MMO, 2011a). The rMCZ covers virtually all of the rocky ground within these ICES Rectangles, and it is therefore assumed that all crawfish caught from these rectangles are from within the rMCZ.		Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:		
		£m/yr	Scenario 1	Scenario 2
		Value of landings affected	0.000	0.002

Table 2b. Commercial fisheries		rMCZ Padstow Bay and Surrounds												
<p><b>UK Nets:</b> Netters active in the rMCZ typically use small vessels under 10 metres in length (MMO, 2011a). Gill netting occurs throughout the rMCZ, and bass and ray are targeted behind the surf line (Finding Sanctuary Vulnerability Assessment, 2011).</p> <p>Estimated value of UK net landings from the rMCZ: £0.033m/yr.</p> <p>Netters do not target crawfish but they are occasionally caught as bycatch (Finding Sanctuary Vulnerability Assessment, 2011). The high value fetched for crawfish means that, when caught, they can make an important contribution to a fisher's income (Potter, pers. comm., 2011). Crawfish landings using nets from the ICES Rectangles (30E4 and 30E5) that cover the rMCZ average £0.001m/yr (MMO, 2011a). The rMCZ covers virtually all of the rocky ground within these ICES Rectangles, and it is therefore assumed that all crawfish caught from these rectangles are from within the rMCZ.</p>	<p><b>Scenario 1:</b> No impacts are anticipated under Scenario 1.</p> <p><b>Scenario 2:</b> Crawfish are not a target species of netters active within the rMCZ and the affected value of landings is low. Therefore no significant impacts are anticipated. It should be noted however that due to their high value, they can make up a significant proportion of a day's fishing income when they are caught.</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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.001</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.001					
£m/yr	Scenario 1	Scenario 2												
Value of landings affected	0.000	0.001												
Total direct impact under Policy Option 1														
<p><b>Total direct impact on UK commercial fishing under Policy Option 1</b></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>0.003</td><td>&lt;0.000</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.001</td><td>&lt;0.000</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	0.003	<0.000	GVA affected	0.000	0.001
£m/yr	Scenario 1	Scenario 2	Best estimate											
Value of landings affected	0.000	0.003	<0.000											
GVA affected	0.000	0.001	<0.000											
<p><b>Impact on non-UK commercial fishing under Policy Option 1</b></p>	<p>None.</p>													

Table 2c. Costs for Commercial fishing under Policy Option 2		rMCZ Padstow Bay and Surrounds							
The SNCB Advice recommends a change in the conservation objective for the Spiny Lobster ( <i>Palinurus elephas</i> ) from “Maintain” to “Recover to favourable condition”. Since this feature is sensitive to potting, potting may be managed in this rMCZ, resulting in additional costs.									
<b>Management scenario 1:</b> No additional management									
<b>Management scenario 2:</b> Closure of entire rMCZ to pots and traps									
<b>Summary of all fisheries:</b> Estimated annual value of landings from the rMCZ: £0.079 m/yr (MCZ Fisheries Model).									
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 2							
<p><b>UK Pots and traps:</b> Potters, primarily from Newquay, Padstow and Port Isaac, work throughout the rMCZ. Their vessels are typically day boats, and they may also fish with nets (Cornwall SFC, 2010). Potters typically target lobster, brown crab and spider crab.</p> <p>Estimated value of UK pot and trap landings from the rMCZ: £0.030m/yr.</p> <p>Potters do not target crawfish, but these are occasionally caught as bycatch (Finding Sanctuary Vulnerability Assessment, 2011). The high value fetched for crawfish means that, when caught, they can make an important contribution to a fisher’s income (Potter, pers. comm., 2011). The value of crawfish landings by potters from the International Council for the Exploration of the Sea (ICES) Rectangles (30E4 and 30E5) that cover the rMCZ averages £0.002m/yr (MMO, 2011a). The rMCZ covers virtually all of the rocky ground within these ICES Rectangles, and it is therefore assumed that all crawfish caught from these rectangles are from within the rMCZ.</p>		<p><b>Scenario 1:</b> No additional impacts</p> <p><b>Scenario 2:</b> Crawfish/Spiny lobster is sensitive to potting, and the closure of the entire rMCZ to this activity can result in loss of landings.</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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.030</td></tr></table>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.030
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.030							
Total direct impact on UK commercial fisheries under Policy Option 2									
		The change in the conservation objective for spiny lobster has resulted in an increase in costs for pots and traps, therefore estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:							

Annex I2. Site specific *Impact Assessment materials (Option 2)*

	£m/yr	Scenario 1	Scenario 2	Best estimate
	Value of landings affected	0.000	0.030	0.004
	GVA affected	0.000	0.015	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.			

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

Table 2e. Ports, harbours, shipping and disposal sites		rMCZ Padstow Bay and Surrounds	
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>			
<b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to disposal of dredge material only. Disposal of material at the Padstow Bay disposal site will only be permitted in the western half of the disposal site (which is outside the rMCZ). No further mitigation additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ will be needed for activities relating to ports, harbours, shipping and disposal sites.			
<b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to navigational dredging, disposal of dredge material and future potential port developments. Additional costs incurred in updating existing Maintenance Dredging Protocols (MDPs) and implementing new MDPs for ports that do not currently have one in place. Disposal of material at the Padstow Bay disposal site will only be permitted in the western half of the disposal site (which is outside the rMCZ). Further additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ may be needed for future harbour developments.			
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Options 1 and 2	
<u>Navigational Dredging:</u> Padstow Harbour is located a few miles to the east of the rMCZ boundary in the Camel Estuary. Maintenance dredging is carried out by Padstow Harbour Commissioners in order to maintain navigable channels. The dredging occurs between 1km and 5km from the rMCZ. Dredged material is sold for use elsewhere where possible; however, some material does not have commercial value and is disposed of at the Padstow Bay disposal site (Padstow Harbour Commissioners, pers. comm., 2011).	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.005	0.008*
<u>Disposal Sites:</u> The Padstow Bay disposal site is situated approximately 2 miles off Rumps Point and straddles the boundary of the rMCZ. An average of 3,400 wet tonnes/yr was disposed of at the site between 1999 and 2008 (Cefas, 2011). The Padstow Harbour Commissioners hold a 3-year licence, which expires in 2013, to dispose of up to 9,999 tonnes/yr at the site (Padstow Harbour Commissioners, pers. comm., 2011). On average, they dispose of material at the site 35 times/yr (Padstow Harbour Commissioners, pers. comm., 2011). There are no other ports or harbours within 5km of the rMCZ.	* 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.		
	<b>Scenario 1:</b>		
<u>Harbour developments:</u> Padstow Harbour is located a few km to the east of	<u>Disposal sites:</u> Future licence applications for disposing of material at the Padstow Bay disposal site will need to consider the potential effects of the dredging on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in additional costs averaging £0.004m/yr.		
	It is assumed for the purposes of the Impact Assessment that potential effects on the features protected by the rMCZ caused by the use of the disposal site would be mitigated if dredged material was disposed of only in the western half of the disposal site, which is outside the rMCZ (Natural England, pers. comm., 2011). This will incur additional costs to the Padstow Harbour Commissioners as the disposal location will be further from shore. It		

Table 2e. Ports, harbours, shipping and disposal sites	rMCZ Padstow Bay and Surrounds
<p>the rMCZ boundary in the Camel Estuary, whilst Port Isaac is located approximately 5km north-east of the rMCZ. There are no known plans for developments at either harbour.</p>	<p>is estimated that closure of the eastern part of the disposal site will add 15 minutes to the time taken per disposal trip, and based on the hourly cost of the disposal services, will result in an additional cost of £40 per trip (Padstow Harbour Commissioners, pers. comm., 2011). Therefore, it is expected that Padstow Harbour Commissioners will incur an additional cost of £1,400/yr (£40 additional cost/trip multiplied by 35 trips/yr) as a result of the rMCZ.</p> <p>Overall, the rMCZ is expected to result in additional costs averaging £0.005m/yr (made up of the additional assessment costs of £0.004m/yr and additional disposal costs of £0.001m/yr).</p> <p>It should be noted that there are no other marine disposal sites on the north coast of Cornwall. As such, in the event that closure of the Padstow Bay disposal site was required to mitigate impacts on features protected by the rMCZ, significantly higher costs would be likely to be incurred for future disposal of dredged material by Padstow Harbour Commissioners.</p> <p><b>Scenario 2:</b></p> <p><u>Disposal sites:</u> Additional costs of £0.005m/yr are expected, as described under Scenario 1.</p> <p><u>Navigational dredging:</u> In addition, under this scenario future licence applications for navigational dredging within 5km of the rMCZ will need to consider the potential effects of the disposed material on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in additional costs averaging £0.002m/yr.</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><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</p>



Table 2e. Ports, harbours, shipping and disposal sites	rMCZ Padstow Bay and Surrounds
	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 2f. Renewable energy		rMCZ Padstow Bay and Surrounds			
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>					
<b>Management scenario 1:</b> 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.)					
<b>Management scenario 2:</b> 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 Options 1 and 2			
<b>Wave energy:</b> 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 <sup>2</sup> , covering 0.4% of the PDA (PMSS, 2010). The rMCZ covers 2.8% of the PDA. As the location of the potential installation is not known, the possible overlap of the electricity generating devices, inter-array and export cables with the rMCZ is not known. One energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015–20 (Department of Energy and Climate Change [DECC], pers. comm., 2011). The development in the PDA is expected to have a production capacity of 520MW by 2030 (PMSS, 2010).		<b>Wave energy:</b> 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	0.016	At least 0.016	0.015
		<b>Scenario 1:</b> The analysis assumes that the potential future tidal energy installation is planned within, or within close proximity to, the rMCZ. As a result of the designation of the rMCZ, the potential licence application for the wave energy installation will need to consider the possible effects of construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.016m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex N for details).			
		<b>Scenario 2:</b> In addition to the costs set out under scenario 1, further costs may occur under			

Table 2f. Renewable energy	rMCZ Padstow Bay and Surrounds
	<p>Scenario 2. The mitigation requires the use of alternative cable protection for export and inter-array cables that have not yet been consented.. As the actual location of the potential installation is unknown, it is unclear whether any inter-array or export cables will be sought that pass through the rMCZ, and if they are what length of cable may be affected. The cost of this mitigation measure is estimated to be £1.000m/km of cable (average of wind energy developers; see Annex H14 for details) and, as such, the total mitigation cost could be significant.</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 Options 1 and 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Padstow Bay and Surrounds
Commercial fisheries (dredges, bottom trawls, and hooks and lines); recreation; research and education; water abstraction, discharge and diffuse pollution*	

\* The IA 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

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<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 scale<sup>8</sup></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 Padstow Bay and Surrounds
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	Maintain	This BSH is currently only reaching the minimum adequacy target.	This site is key in meeting connectivity in FS Regional Project Area	
A4.2 Moderate energy circalittoral rock	BSH	✓ * 2	✓	✓	None	Maintain	This BSH is currently only reaching the minimum replication target.	This site is key in meeting connectivity in FS Regional Project Area	

<sup>8</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A3.2 Moderate energy infralittoral rock	BSH	✓	✓	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project Area	
A4.1 High energy circalittoral rock	BSH	✓	✓	✓	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	
A1.1 High 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		This site is key in meeting connectivity in FS Regional Project Area	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A2.3 Intertidal mud <sup>4</sup>	BSH	✓	✓	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project Area	
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project Area	
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain		This site is key in meeting connectivity in FS Regional Project Area	
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.
Pink sea-fan <i>Eunicella verrucosa</i>	FOCI Species	✓	✓	✓	None	Maintain			This feature has a limited national distribution.
Stalked jellyfish <i>Halicystus auricula</i>	FOCI Species	✓	✓	✓	None	Maintain	This feature is not protected in any existing MPAs within the SW region		

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Stalked jellyfish <i>Lucernariopsis cruxmelitensis</i>	FOCI Species	✓ * 3	✓	✓	None	Recover	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.
Spiny lobster <i>Palinurus elephas</i>	FOCI Species	✓ * 3	✓	✓	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.	There is evidence that <i>Palinurus elephas</i> is in unfavourable condition in all SW waters.	There is evidence that <i>Palinurus elephas</i> is in unfavourable condition in all SW waters. It has a limited distribution nationally.
Bottlenose Dolphin <i>Tursiops truncatus</i>	N/A	N/A	N/A	N/A	N/A	Maintain			This species is a UK BAP priority species.

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Fulmar <i>Fulmarus glacialis</i>	N/A	N/A	N/A	N/A	N/A	Maintain	There are few sites where non-ENG features have been proposed.	This site would provide a seaward extension to the Pentire Peninsular SSSI, therefore providing protection for loafing and feeding areas of the species.	
Guillemot <i>Uria aalge</i>	N/A	N/A	N/A	N/A	N/A	Maintain	There are few sites where non-ENG features have been proposed.	This site would provide a seaward extension to the Pentire Peninsular SSSI	
Puffin <i>Fratercula arctica</i>	N/A	N/A	N/A	N/A	N/A	Maintain	There are few sites where non-ENG features have been proposed.	This site would provide a seaward extension to the Pentire Peninsular SSSI	
Razorbill <i>Alca torda</i>	N/A	N/A	N/A	N/A	N/A	Maintain	There are few sites where non-ENG features have been proposed.	This site would provide a seaward extension to the Pentire Peninsular SSSI	
Kittiwake <i>Rissa tridactyla</i>	N/A	N/A	N/A	N/A	N/A	Maintain	There are few sites where non-ENG features have been proposed.	This site would provide a seaward extension to the Pentire Peninsular SSSI	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Area of Additional Ecological Importance	✓ * <sup>4</sup>
Overlaps with existing MPAs	✓ * <sup>5</sup>

**Additional comments and site benefits:**

<sup>1</sup> Adequacy for the BSH Subtidal coarse sediment is only just met in the Finding Sanctuary region. The target percentage of area included is 17.2% and therefore just about at the minimum (17–38% required).

<sup>2</sup> Replication is only just met for BSH Moderate energy circalittoral rock.

<sup>3</sup> FOCI species *Lucernariopsis cruxmelitensis* and *Palinurus elephas* are only at their minimum for replication in the Finding Sanctuary region.

<sup>4</sup> The rMCZ also encompasses Moulds Island and its surroundings, which is an area of productive tidal fronts and a particularly rich area for marine seabirds, dolphin spp., harbour porpoise and basking sharks.

<sup>5</sup> The rMCZ arches around coastal areas which are important seabird colony areas (SSSI designated). The rMCZ designation will allow protection for those seabirds when feeding at sea.

Finding Sanctuary have suggested adding (and made conservation objectives for), a number of non-ENG mobile species including the Bottlenose dolphin (*Tursiops truncatus*), Fulmars (*Fulmarus glacialis*), Guillemots (*Uria aalge*), Puffins (*Fratercula arctica*), Razorbills (*Alca torda*), and kittiwakes (*Rissa tridactyla*) as the area is particularly rich for these species.

The area intersects with a higher than average benthic species and habitat diversity area (within the south-west context) (SAD in (Lieberknecht, et al. 2011)).

The rich marine flora and fauna here attracts tourists through boat rides to see birds and other marine life.

The site intersects with polygonal data which the Seahorse Trust provided to Finding Sanctuary, indicating the stretches of the south-west coastline along which one or both species of seahorse are found.



### 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 Padstow Bay and Surrounds
Baseline	Beneficial impact under Policy Options 1 and 2	
<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. Rock habitats are important 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, with the exception of crawfish, for which provision is commensurate to that when in unfavourable condition.</p> <p>Commercial fishing in the rMCZ is primarily carried out using pots and traps, and nets. The area is principally worked by potters from Newquay, Padstow and Port Isaac targeting lobsters, brown crab and spider crab. Netters primarily target bass and rays. Estimated value of landings is £0.079m/yr.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of crawfish from the rMCZ.</p> <p>No change in feature condition or general harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Landings of crawfish from the rMCZ may be prohibited and this may allow local crawfish populations to improve. Any spill-over of crawfish from the rMCZ may benefit fishers in the local area.</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 style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ Padstow Bay and Surrounds
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Table 5b. Recreation		rMCZ Padstow Bay and Surrounds
Baseline	Beneficial impact under Policy Options 1 and 2	
<p><b>Angling:</b> Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and for recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition.</p> <p>Padstow is a popular spot for angling. The main species are carp, tench, bream, roach, rudd and perch. Local companies provide boat trips for anglers. It has not been possible to estimate the value of angling in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of crawfish from the rMCZ.</p> <p>No change in feature condition or general harvesting of fish and shellfish (with the exception of crawfish, which is not typically targeted by anglers) is anticipated and therefore no on-site or off-site benefits are expected.</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>
<p><b>Diving:</b> Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition.</p> <p>Local companies provide SCUBA diving training and guided dives in Padstow. It has not been possible to estimate the value of diving in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition (with the exception of crawfish, which are not typically a focus for divers).</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 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: Moderate</p>
<p><b>Wildlife watching:</b> 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</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition (with the exception of crawfish, which are not typically a focus for wildlife watching).</p>	<p>Anticipated direction of change:</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*


Table 5b. Recreation		rMCZ Padstow Bay and Surrounds
<p>is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition.</p> <p>Boat trips are available from Padstow harbour for visitors to experience the local wildlife, including grey seal, dolphins, porpoises, basking shark and sunfish. It has not been possible to estimate the value of wildlife watching in the rMCZ.</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>	  Confidence: Moderate



Table 5c. Research and education		rMCZ Padstow Bay and Surrounds
Baseline	Beneficial impact under Policy Options 1 and 2	
<p><b>Research:</b> 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>   Confidence: High
<p><b>Education:</b> 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 Polzeath Marine Visitor Centre received 1,355 visitors in 2008 (Cornwall Council, date unknown). The centre is open during the summer and, in partnership with Cornwall Wildlife Trust and the National Trust, holds a variety of education events focusing on the marine and coastal environment. The coastline of the rMCZ receives high numbers of visitors. It has not been</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>   Confidence:

Table 5c. Research and education		rMCZ Padstow Bay and Surrounds
possible to estimate the value derived from education activities associated with the rMCZ.		Moderate

Table 5d. Regulating services		rMCZ Padstow Bay and Surrounds
Baseline	Beneficial impact under Policy Options 1 and 2	
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> 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><b>Natural hazard protection:</b> 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, with the exception of crawfish, which will be recovered to favourable condition.</p> <p>No change in feature condition and management of human activities, with the exception of crawfish, is expected and therefore no significant benefit to the regulation of pollution is expected.</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 style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ Padstow Bay and Surrounds
Baseline	Beneficial impact under Policy Options 1 and 2	

Table 5e. Non-use and option values	rMCZ Padstow Bay and Surrounds	
<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>Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society ‘Your Seas Your Voice’ campaign expressed a desire to protect the area because of the amazing nature of the place, and because they had a personal connection with the area. Other important factors were the spectacular plants and animals of the site, its spectacular overall biodiversity and scenery.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**rMCZ Poole Rocks****Site area (km<sup>2</sup>): 3.7**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, draft conservation objectives for some features have been changed from those established by the Regional Projects. These changes and their impacts on management and costs are reflected under Policy Option 2.

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

**SNCBs advise that the conservation objective for the Couch's goby (*Gobius couchi*) is changed from "Maintain" to "Recover"; therefore Policy Option 2 uses the "Recover" conservation objective for this feature.**

<i>Ostrea edulis</i>	-	6	Favourable Condition	Maintained at Favourable Condition
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**SNCBs advise that the conservation objective for the Native oyster (*Ostrea edulis*) is changed from "Maintain" to "Recover"; therefore Policy Option 2 uses the "Recover" conservation objective for this feature.**

**Option 2:** This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.

Subtidal sand, Subtidal mixed sediments, Couch Goby (*Gobius couchii*), Native oyster (*Ostrea edulis*)

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

Table 2a. Ports, harbours, shipping and disposal sites		rMCZ Poole Rocks	
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>			
<b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to navigational dredging and disposal of dredge material only. It is not anticipated that any additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ will be needed for activities relating to ports, harbours, shipping and disposal sites. .			
<b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to navigational dredging, disposal sites and future licence applications for potential port and harbour developments within 5km of the rMCZ. Additional costs incurred in updating existing Maintenance Dredging Protocols (MDPs). Additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ may be needed for future port and harbour developments.			
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Options 1 and 2	
<u>Navigational Dredging:</u> There is a maintained dredged channel (the Swash Channel) extending out from the entrance to Poole Harbour in a south-easterly direction that allows access to the harbour by larger vessels. The channel is maintained by Poole Harbour Commissioners as part of their statutory duties.	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.000	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			

Table 2a. Ports, harbours, shipping and disposal sites	rMCZ Poole Rocks
<p>The channel is more than 1km but less than 5km from the rMCZ. No other ports, harbours or dredging activities are within 5km of the rMCZ.</p> <p><u>Disposal Sites:</u> No disposal sites are situated within 1km of the rMCZ. Disposal-at-sea activities occur within 5km of the rMCZ at Bournemouth Beach (beach recharge), Brownsea (experimental site) disposal site, Poole Bay disposal site and Swanage Bay disposal site. For the purposes of the Impact Assessment (IA), it is assumed that an average of 4.9 applications (equivalent to the average number/yr between 2001 and 2010 [Cefas, 2011]) for licences to dispose of material at the disposal sites will be made in each year over the timeframe of the IA.</p> <p><u>Harbour development:</u> The entrance to Poole Harbour is situated within 5km of the rMCZ, although most of the infrastructure in the harbour is more than 5km from the rMCZ. There are no known plans for developments.</p>	<p>on different assumptions to those used to estimate costs at a regional level and for the entire suite of sites.</p> <p><b>Scenario 1:</b> No impacts are anticipated under this scenario.</p> <p><b>Scenario 2:</b></p> <p><u>Navigational dredging:</u> Poole Harbour Commissioners operate under the marine dredging protocol (MDP) and it is expected that their MDP baseline document will need to be updated to include consideration of the effects of their dredging on features protected by the rMCZ and the potential to achieve the rMCZ conservation objectives. This is expected to result in an additional cost of approximately £0.007m from 2013 (see Annex N for details), recurring every 3 years (Natural England, pers. comm., 2011).</p> <p><u>Disposal sites:</u> Future licence applications for disposing of material at sea within 5km of the rMCZ will need to consider the potential effects of the disposed material on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in additional costs averaging £0.033m/yr.</p> <p><u>Harbour development:</u> For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at 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 2b. National defence	rMCZ Poole Rocks
<p><b>Source of costs of the rMCZ under Policy Options 1 and 2</b></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</p>	



Table 2b. National defence		rMCZ Poole Rocks
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 Options 1 and 2	
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities. The rMCZ is in an MOD exercise area.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base (they are not assessed for this rMCZ alone).	

Table 2c. Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ Poole Rocks
Costs of impact of rMCZ on the sector under Policy Options 1 and 2	
<b>Oil and gas related activities (including carbon capture and storage):</b> 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).	

Table 2d. Commercial fishing	rMCZ Poole Rocks
<b>Source of costs of the rMCZ</b>	
<b>Policy Option 1</b>	
No management anticipated (and therefore no costs).	
<b>Policy Option 2</b>	
The conservation objective (CO) for the Couch's goby ( <i>Gobius couchi</i> ) and the Native oyster ( <i>Ostrea edulis</i> ) have been changed from "Maintain" to "Recover to favourable condition", and under Option 2, this CO is used for both species.	

Table 2d. Commercial fishing		rMCZ Poole Rocks							
<p>Couch's goby has only been recorded in four locations across the UK, and this species is vulnerable to benthic trawling. Although there is a low exposure to trawling in the area, the rarity of the species requires the extra protection of the recover conservation objective.</p> <p>The native oyster is also highly vulnerable to benthic trawling, and although there is low exposure to benthic trawling in the area, the concern is that a conservation objective of maintain in an open and unrestricted public fishery might pose a significant risk of deterioration in the absence of management.</p> <p>The vulnerability of both these species to bottom trawling means that it is likely that there will be additional management for this activity.</p>									
<p><b>Management Scenario 1: No additional management</b></p> <p><b>Management scenario 2: Closure of the entire site to dredges and bottom trawls.</b></p>									
<p><b>Summary of all fisheries:</b> Estimated annual value of landings from the rMCZ: £0.060 m/yr (MCZ Fisheries Model).</p>									
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 2							
<p><b>UK Bottom trawling</b></p> <p>Estimated value of UK bottom trawling from the rMCZ is £0.033m/year.</p> <p>No further baseline information is available at this stage as the management scenario resulting from the SNCB advice on change in conservation objectives was received after the Regional Projects had finished.</p>		<p><b>Scenario 1:</b> no additional impacts anticipated.</p> <p><b>Scenario 2:</b> The baseline scenario shows that the value of landings from bottom trawls in this area is currently around £0.033m/yr.</p> <p>Estimated annual value of UK bottom dredging 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>0.033</td></tr></table>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.033
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.033							
<p><b>UK Bottom dredging</b></p> <p>Estimated value of UK bottom dredging from the rMCZ is £0.003m/year.</p> <p>No further baseline information is available at this stage as the management scenario resulting from the SNCB advice on change in conservation</p>		<p><b>Scenario 1:</b> no additional impacts anticipated.</p> <p><b>Scenario 2:</b> The baseline scenario shows that the value of landings from dredging in this area is currently around £0.003m/yr.</p>							

Table 2d. Commercial fishing		rMCZ Poole Rocks		
objectives was received after the Regional Projects had finished.	Estimated annual value of UK bottom dredging landings affected is expected to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	
	Value of landings affected	0.000	0.003	
Total Direct Impact under Policy Option 2				
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	0.000	0.036	0.005
	GVA affected	0.000	0.017	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.			

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

<b>Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ Poole Rocks</b>
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**2.2 Policy Option 1**

Commercial fisheries: dredges, bottom trawls, and hooks and lines; oil and gas (existing activity); recreation; water pollution from activities on land

**Policy Option 2**

Commercial fisheries: hooks and lines; oil and gas (existing activity); recreation; water pollution from activities on land

**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<sup>9</sup>

✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate where we do not agree with a feature being proposed for designation. Recommended conservation objectives in italics 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.

rMCZ Poole Rocks

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	None	Maintain			

<sup>9</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A5.2 Subtidal sand	BSH	✓	✓	X	None	Maintain			
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	X	None	Maintain			
Couch's goby <i>Gobius couchi</i>	FOCI species	✓	✓	✓	None	Maintain	There are only two sites proposed for this species in the regional project.	This species is very rare and this is the only one of two sites put forward for designation.	Outside of the Finding Sanctuary area, no site has been proposed for this feature.
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓	None	Maintain			

Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	✓ * 1
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓
Overlaps with existing MPAs	None

**Additional comments and site benefits:**

This site is important for the rare FOCI species *Gobius couchi*, which has only ever been recorded in 4 locations around the UK.

<sup>1</sup> This site is an area of rocky outcrops within the mainly sediment-dominated area of Poole Bay. (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 Poole Rocks
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. Rock habitats are important for inshore commercial fisheries species (particularly crabs and lobsters), as are subtidal sediments (Fletcher and others, 2012). The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition.</p> <p>Potting occurs throughout the rMCZ, cuttlefish are targeted seasonally and there is also a low level of seasonal netting. Oyster dredging occurs in and around the rMCZ. Estimated value of landings is £0.060m/yr.</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>
	Beneficial impact under Policy Option 2	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1)</p> <p>SNCBs advise that the conservation objective for Couch's goby (<i>Gobius couchi</i>) and the Native oyster (<i>Ostrea edulis</i>) is changed from "maintain" to "recover", and other site habitats and species will be maintained in favourable condition. New management of fishing activities is expected</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence:</p>

Table 5a. Fish and shellfish for human consumption		rMCZ Poole Rocks
	<p>(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 may improve as a result of a recovery in the condition of habitat and reduced fishing pressure. Most notably stocks of native oyster are likely to improve to favourable condition. If some fishing for such species is permitted within the rMCZ, then catches may improve. Localised beneficial spill-over effects may occur in the locality of 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>	Low

Table 5b. Recreation		rMCZ Poole Rocks
Baseline	Beneficial impact under Policy Options 1 and 2	
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 Poole Rocks
Baseline	Beneficial impact under Policy Options 1 and 2	

Table 5c. Research and education		rMCZ Poole Rocks
<p><b>Research:</b> 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><b>Education:</b> 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 approximately 1 nautical mile from shore, it is unlikely that significant 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 Poole Rocks
Baseline	Beneficial impact under Policy Option 1	
<p><b>Regulation of pollution:</b> The features of the site contribute to the bioremediation of waste and sequestration of carbon. Marine sediments, through processes that occur in their upper layers, play an important role in the global cycling of many elements, including carbon and nitrogen. Native oyster beds sequester carbon and filter algae and sediment from the water (Fletcher and others, 2012).</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</p>	<p>Anticipated direction of change:</p> <p>↔</p>





Table 5d. Regulating services		rMCZ Poole Rocks
<p><b>Environmental resilience:</b> 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><b>Natural hazard protection:</b> 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>	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
	<b>Beneficial impact under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for Couch's goby (<i>Gobius couchi</i>) and the Native oyster (<i>Ostrea edulis</i>) is changed from "maintain" to "recover". If the conservation objectives of the features are achieved, the area of native oyster <i>Ostrea edulis</i> beds and the species couch's goby <i>Gobius couchi</i> will recover to favourable condition. Other site habitats and species 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. In particular, recovery of native oyster <i>Ostrea edulis</i> beds may increase levels of carbon sequestration.</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>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Poole Rocks
Baseline	Beneficial impacts under Policy Options 1 and 2	
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>Confidence: Moderate</p>

## rMCZ Skerries Bank and Surrounds

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, the draft conservation objective for one feature of this site has been changed from that established by the Regional Projects. This change and its impacts on management and costs are reflected under Policy Option 2.

**Site area (km<sup>2</sup>): 249.69**

Table 1. Conservation impacts	rMCZ Skerries Bank and Surrounds
<b>1a. Ecological description</b>	
<p>The landward boundary of the recommended Marine Conservation Zone (rMCZ) runs along the high water mark from Leek Cove around Prawle Point and Start Point to Torcross and comprises a rocky coast open to the full force of prevailing winds and waves. Skerries Bank is a 7km-long series of submerged sand and gravel habitat banks. The site extends from the coastline to depths of approximately 70 metres.</p> <p>The rMCZ intersects with an area of higher than average benthic species diversity and higher than average pelagic interest. Local group feedback indicates that the area is also an important breeding area for flatfish as well as for mobile species. The rMCZ overlaps with the Start Point to Plymouth Sound and Eddystone candidate Special Area of Conservation (SAC), and with the Prawle Point to Start Point draft SAC. Two Sites of Special Scientific Interest are located along the shoreline adjacent to this rMCZ.</p> <p>Exposed rocky shores have been described as dominated by barnacles with rich sublittoral fringe communities characterised by <i>Fucus serratus</i> and <i>Laminaria digitata</i>, with dense kelp forest characterising infralittoral habitats at many sites. Epiphytic red algae grew in profusion on the kelp stipes and the adjacent bedrock. Species recorded include <i>Delesseria sanguinea</i>, <i>Dilsea carnosa</i>, <i>Plumaria elegans</i> and the tufted coralline alga <i>Corallina officinalis</i>. The fauna are characteristic of wave-exposed conditions and include the sponges <i>Pachymatisma johnstonia</i> and <i>Clathrina coriacea</i>, and the sea squirt <i>Distomus variolosus</i>.</p> <p>Boreal offshore muddy-sand, characterised by bivalve and gastropod molluscs, burrowing crustaceans (e.g. <i>Callinassa subterranea</i>), brittlestars, heart urchin <i>Echinocardium cordatum</i> and sea cucumbers, and boreal offshore mud associations, characterised by the burrowing echinuran <i>Maxmuelleria lankesteri</i>, have been found in Start Bay.</p> <p>The reef areas of Lyme Bay, which comprises rock and mixed ground, extend from Portland Bill to central Lyme Bay and off Start Point. Their species which are listed for conservation are <i>Axinella dissimilis</i>, Ross coral <i>Pentapora fascialis</i>, dead man's fingers <i>Alcyonium digitatum</i>, pink sea-fan <i>Eunicella verrucosa</i> and sunset cup coral <i>Leptopsammia pruvoti</i>.</p> <p>Start Bay has a series of shingle banks and sandy coves leading to the rocky headland of Start Point. The exposed sloping shores are dominated by limpets and barnacles with sparse mussels and algae with well-developed lichen communities on the upper shore and in the splash zones. Slapton Sands is exposed to a low-to-medium energy</p>	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

wave climate and is the largest of 4 gravel barriers in Start Bay, the others being Hallsands, Beesands and Blackpool Sands. At high tide, these gravel barriers represent separate environments but, except for Blackpool Sands, they are connected during spring low tide (Lieberknecht and others, 2011).

**1b. MCZ Feature Baseline and Impact of MCZ**

Feature	Area of feature (km2)	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
High energy infralittoral rock	1.27	-	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	0.30	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	0.08	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.20	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	0.03	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.04	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy circalittoral rock	101.79	-	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for moderate energy circalittoral rock is changed from “Maintain” to “Recover” due to the exposure of the feature to bottom trawling. Option 2 uses the conservation objective “Recover” for this feature.</b>				
Moderate energy infralittoral rock	4.41	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.02	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	12.50	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mud	4.06	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	41.55	-	Favourable condition	Maintained at favourable condition
<i>Habitats of Conservation Importance</i>				
Intertidal under boulder communities	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Euinella verrucosa</i>	-	1	Favourable Condition	Maintained at Favourable Condition

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<i>Hippocampus hippocampus</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Palinurus elephas</i>	-	2	Unfavourable Condition	Recover to Favourable Condition
<p><b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>High energy infralittoral rock, moderate energy circalittoral rock, Pink sea fan (<i>Euinella verrucosa</i>), Spiny lobster ( <i>Palinurus elephas</i>)</p>				

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

Table 2a. Archaeological heritage		rMCZ Skerries Bank and Surrounds
<p><b>Source of costs of the rMCZ</b></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 Options 1 and 2	
Two historic shipwreck sites designated under the Protection of Wrecks Act 1973 are located within the rMCZ: Moor Sands and Salcombe Cannon. Since 2003, between one and two licences have been granted to survey the wrecks each year apart from in 2010. Similarly, since 2003, between one and two surface recovery licences have been granted each year, as well as one excavation licence in 2003. Further wrecks are recorded within and around the site. Peat is recorded in the site. English Heritage has indicated that this site is likely to be of interest for archaeological excavation in the future as it is relevant to its National Heritage Protection Plan (theme 3A1.2). (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost of one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.	

Table 2b. Commercial fisheries		rMCZ Skerries Bank and Surrounds										
<b>Source of costs of the rMCZ under Policy Option 1</b>												
<b>Management scenario 1 (Finding Sanctuary Steering Group management recommendation):</b> No additional management – continuation of the existing South Devon Inshore Potting Agreement (IPA) management regime.												
No additional management scenarios have been considered for this rMCZ as the rMCZ was put forward by the Finding Sanctuary Steering Group on the condition that the existing management arrangements remain unchanged.												
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1										
<b>Overview:</b> The rMCZ is largely inside the 6nm (nautical mile) limit. Because of restrictions on trawling, fishing inside the rMCZ is dominated by static gear with the site heavily fished year round. The site is particularly valuable for potters, with brown crab and lobster the key target species. The rMCZ sits wholly within the area of the South Devon Inshore Potting Agreement (IPA), which manages fishing via licence variations. The rMCZ overlaps with three of the IPA’s seasonal trawl corridors which permit trawling at certain times of the year (Devon and Severn IFCA, 2011). The majority of the rMCZ overlaps with areas where dredging and trawling are currently restricted year-round under the IPA. The ports of Kingsbridge, Salcombe and Beesands are all close to the rMCZ with around 45 resident vessels (MMO, 2010a), many of which are reliant on fishing inside the rMCZ (MMO, 2011a).												
Estimated total value of UK vessel landings from the rMCZ: £1.216m/yr.												
The north-west corner of the rMCZ overlaps with the Start Point to Plymouth Sound & Eddystone Special Area of Conservation (SAC), which is an area that is already permanently closed to trawling and dredging under the IPA. It is not yet known whether management of the SAC will affect the static gear fishing activity in this part of the rMCZ.												
Total Direct Impact under Policy Option 1												
<b>Total direct impact on UK commercial fishing</b>		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>0.000</td><td>&lt;0.000</td></tr><tr><td>GVA affected</td><td>0.000</td><td>&lt;0.000</td></tr></table>		£m/yr	Scenario 1	Best estimate	Value of landings affected	0.000	<0.000	GVA affected	0.000	<0.000
£m/yr	Scenario 1	Best estimate										
Value of landings affected	0.000	<0.000										
GVA affected	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.										

Table 2b. Commercial fisheries	rMCZ Skerries Bank and Surrounds
	<p>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>As the rMCZ management scenario results in no changes to the existing fisheries management, including access arrangements for trawlers and dredgers, no impacts are expected. However, concerns have been raised by fisheries stakeholders that the designation of an MCZ over part of the IPA may lead to renegotiations by fishers of the boundaries for the IPA and of the seasonal periods in which dredging and trawling are restricted, using the rMCZ as a reason. Any renegotiations could increase or decrease access to different gear types and thereby impact on the landings of fishers in the area.</p>
<b>Impact on non-UK commercial fishing</b>	None.

Table 2c. Costs for Commercial fishing under Policy Option 2	rMCZ Skerries Bank and Surrounds
<p><b>Source of costs of the rMCZ under Policy Option 2</b></p> <p>Due to the change in the conservation objective for moderate energy circalittoral rock, an additional management scenario, management scenario 2, is added.</p> <p><b>Management scenario 1 (Finding Sanctuary Steering Group management recommendation):</b> No additional management – continuation of the existing South Devon Inshore Potting Agreement (IPA) management regime.</p> <p><b>Management scenario 2:</b> Closure of entire rMCZ to all gears</p>	
Baseline description of activity	Costs of impacts of the rMCZ on the sector under Policy Option 2
<p><b>Overview:</b> The rMCZ is largely inside the 6nm (nautical mile) limit. Because of restrictions on trawling, fishing inside the rMCZ is dominated by static gear with the site heavily fished year round. The site is particularly valuable for potters, with brown crab and lobster the key target species. The rMCZ sits wholly within the area of the South Devon Inshore Potting Agreement (IPA), which manages fishing via licence variations. The rMCZ overlaps with three of the IPA's seasonal trawl corridors which permit trawling at certain times of the year (Devon and Severn IFCA, 2011). The majority of the rMCZ overlaps with areas where dredging and trawling are currently restricted year-round under the IPA. The ports of Kingsbridge, Salcombe and Beesands are all close to the rMCZ with around 45 resident vessels (MMO, 2010a), many of which are reliant on fishing inside the rMCZ (MMO, 2011a).</p>	

Table 2c. Costs for Commercial fishing under Policy Option 2		rMCZ Skerries Bank and Surrounds							
Estimated total value of UK vessel landings from the rMCZ: £1.216m/yr.									
The north-west corner of the rMCZ overlaps with the Start Point to Plymouth Sound & Eddystone Special Area of Conservation (SAC), which is an area that is already permanently closed to trawling and dredging under the IPA. It is not yet known whether management of the SAC will affect the static gear fishing activity in this part of the rMCZ.									
<b>UK Dredges</b>  Estimated value of UK dredges from the rMCZ is £0.024m/year.	<b>Scenario 1:</b> no additional impacts anticipated.  <b>Scenario 2:</b> Closure of entire rMCZ to all gears  Estimated annual value of UK bottom trawling 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>0.024</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.024
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.024							
<b>UK Bottom Trawls</b>  Estimated value of UK bottom trawling from the rMCZ is £0.029m/year.	<b>Scenario 1:</b> no additional impacts anticipated.  <b>Scenario 2:</b> Closure of entire rMCZ to all gears  Estimated annual value of UK bottom trawling 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>0.029</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.029
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.029							
<b>UK Mid-water Trawls</b>  Estimated value of UK mid-water trawls from the rMCZ is £0.003m/year	<b>Scenario 1:</b> no additional impacts anticipated.  <b>Scenario 2:</b> Closure of entire rMCZ to all gears								



Table 2c. Costs for Commercial fishing under Policy Option 2		rMCZ Skerries Bank and Surrounds	
	Estimated annual value of UK bottom trawling landings affected is expected to fall within the following range:		
	£m/yr	Scenario 1	Scenario 2
	Value of landings affected	0.000	0.003
<b>UK Pots and Traps</b> Estimated value of UK pots and traps from the rMCZ is £0.946m/year	<b>Scenario 1:</b> no additional impacts anticipated.  <b>Scenario 2:</b> Closure of entire rMCZ to all gears  Estimated annual value of UK bottom trawling landings affected is expected to fall within the following range:		
	£m/yr	Scenario 1	Scenario 2
	Value of landings affected	0.000	0.946
<b>UK Nets</b> Estimated value of UK nets from the rMCZ is £0.150m/year	<b>Scenario 1:</b> no additional impacts anticipated.  <b>Scenario 2:</b> Closure of entire rMCZ to all gears  Estimated annual value of UK bottom trawling landings affected is expected to fall within the following range:		
	£m/yr	Scenario 1	Scenario 2
	Value of landings affected	0.000	0.150
<b>UK Hooks and Lines</b> Estimated value of UK hooks and lines from the rMCZ is £0.064m/year.	<b>Scenario 1:</b> no additional impacts anticipated.  <b>Scenario 2:</b> Closure of entire rMCZ to all gears		

Table 2c. Costs for Commercial fishing under Policy Option 2		rMCZ Skerries Bank and Surrounds		
	Estimated annual value of UK bottom trawling landings affected is expected to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	
	Value of landings affected	0.000	0.064	
Total Direct Impact under Policy Option 2				
<b>Total direct impact on UK commercial fishing</b>	Estimated annual value of UK vessel landings and gross value added (GVA) affected:			
	£m/yr	Scenario 1	Scenario 2	Best estimate
	Value of landings affected	0.000	1.213	0.079
	GVA affected	0.000	0.587	0.038
	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.			
<b>Impact on non-UK commercial fishing</b>	None.			

Table 2d. Ports, harbours, shipping and disposal sites	rMCZ Skerries Bank and Surrounds
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**Source of costs of the rMCZ under Policy Options 1 and 2**

**Management scenario 1:** Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. (Not relevant for this rMCZ). It is anticipated that no additional mitigation, relative to mitigation provided in the baseline, of impacts on features protected by the MCZ will be needed for activities relating to ports, harbours, shipping and disposal sites.

**Management scenario 2:** Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to disposal of dredge material and future potential port developments. Additional mitigation of impacts on features protected by the rMCZ may be needed for port developments, relative to the baseline.

Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Options 1 and 2		
<p><u>Disposal Sites:</u> Disposal of material takes place at the Bolt Head disposal site. The disposal site is between 1km and 5km to the west of the rMCZ. For the purposes of the Impact Assessment (IA), it is assumed that an average of 0.1 applications (equivalent to the average number/yr between 2001 and 2010 [Cefas, 2011]) for licences to dispose of material at the Bolt Head disposal site will be made in each year over the timeframe of the IA.</p> <p><u>Harbour development:</u> The harbours of Beesands and Salcombe are within 5km of the rMCZ. There are no known plans for development at either harbour.</p>	<i>£m/yr</i>	Scenario 1	Scenario 2
	Cost to the operator	0.000	0.001*
	<p>* 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.</p> <p><b>Scenario 1:</b> No costs are anticipated under Scenario 1.</p> <p><b>Scenario 2:</b></p> <p><u>Disposal sites:</u> Future licence applications for disposing of material at sea within 5km of the rMCZ will be required to consider the potential effects of the disposed material on the features protected by the rMCZ and their conservation objectives. This is expected to result in additional costs averaging £0.001m/yr.</p> <p><u>Harbour development:</u> For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at 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</p>		

Table 2d. Ports, harbours, shipping and disposal sites		rMCZ Skerries Bank and Surrounds
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>		
<p><b>Management scenario 1:</b> 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><b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to disposal of dredge material and future potential port developments. Additional mitigation of impacts on features protected by the rMCZ may be needed for port developments, relative to the baseline.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Options 1 and 2	
	significant costs of mitigation could arise.	

Table 2e. Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ Skerries Bank and Surrounds
<p><b>Cables (interconnectors and telecom cables):</b> 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 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Skerries Bank and Surrounds
<p><b>Under Policy Option 1</b></p> <p>Cables (existing interconnectors and telecom cables); commercial fisheries (dredges, bottom trawls, pots and traps, nets, and hooks and lines); recreation; research and education; water abstraction, discharge and diffuse pollution*.</p>	

**Under Policy Option 2**

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 scale<sup>10</sup>

✓ = 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 Skerries Bank and Surrounds

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			
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain			

<sup>10</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
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	✓	✓	✓	None	Maintain			
A3.2 Moderate energy infralittoral rock	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the largest area of moderate energy infralittoral rock		
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 the existing MPAs in the FS area	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A5.2 sand	Subtidal	BSH	✓	✓	✓	None	Maintain		Only a small proportion (<1%) of this BSH is currently protected within the existing MPAs in the FS area	
A5.3 mud	Subtidal	BSH	✓	✓	✓	None	Maintain			
Pink sea-fan <i>Eunicella verrucosa</i>		FOCI Species	✓	✓	✓	None	Maintain			BAP and WCA species
Short-snouted seahorse <i>Hippocampus hippocampus</i>		FOCI Species	✓ * 1	✓	✓	None	Maintain	This FOCI is currently only reaching the minimum replication target	This feature is not protected within existing MPAs in the FS area	BAP, OSPAR and WCA species
Intertidal underboulder communities		FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Spiny lobster <i>Palinurus elephas</i>		FOCI Species	✓	✓	✓	None	Recover	This feature is not protected in any existing MPAs within the SW. region,  This FOCI is currently only reaching the minimum replication	There is evidence that <i>Palinurus elephas</i> is in unfavourable condition in all SW waters.	BAP species. This feature has limited distribution in the whole MCZ area (only proposed sites occur in the FS region)

Annex I2. Site specific *Impact Assessment materials (Option 2)*

							target		
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:**

<sup>1</sup> Viability for *Hippocampus hippocampus* is dependent on patch diameter (0.5km). A 0.5km area encompassing the record(s) is possible within this rMCZ.

<sup>2</sup> Maerl has also been recorded as being present within the rMCZ. This area is an important breeding area for flat fish and also a breeding ground for mobile species.

This rMCZ overlaps with the Inshore Potting Agreement (IPA) and so is considered to be a 'de-facto' MPA already (SAD in (Lieberknecht, et al. 2011)).

This rMCZ contains an area of higher than average benthic species diversity, and is located within an area of higher than average pelagic interest (SAD in (Lieberknecht, et al. 2011)).

There is a significant amount of scientific records for this site, in particular for Start Bay and the Skerries Bank area (SAD in (Lieberknecht, et al. 2011)).

Skerries Bank is a unique feature in the south-west with steep slopes and unusual fish communities.

This sea bed within this rMCZ is suggested to be in good condition within the existing no-trawling areas (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 Skerries Bank and Surrounds	
<b>Baseline</b>  Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption. Rock habitats are important for inshore commercial fisheries species (particularly crabs and lobsters), as are subtidal sediments (Fletcher and others, 2012). Crawfish <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, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition.  A description of on-site fishing activity and the value derived from it is set out in Table 2b.	<b>Beneficial impact under Policy Option 1</b>		Anticipated direction of change:  ↑  Confidence: Low
	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of crawfish from the rMCZ.  No change in feature condition or general harvesting of fish and shellfish is anticipated and therefore no on-site or off-site benefits are expected. Landings of crawfish from the rMCZ may be prohibited and this may allow local crawfish populations to improve. Any spill-over of crawfish from the rMCZ may benefit fishers in the local area.  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).		
	<b>Beneficial impact under Policy Option 2</b>		Anticipated direction of change:  Unclear
The possible impacts may differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1)  SNCBs advise that the conservation objective for moderate energy circalittoral rock is changed from “Maintain” to “Recover”. If the conservation objectives of the features are achieved, moderate energy circalittoral rock and crawfish will be recovered to favourable condition. The other features of			

Table 5a. Fish and shellfish for human consumption	rMCZ Skerries Bank and Surrounds
	<p>the site 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 moderate energy circalittoral rock habitat to the provision of fish and shellfish for human consumption. The rMCZ is relatively large for an inshore site, 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 improve as a result of direct targeted management and, depending on whether any targeting of crawfish is permitted from within the rMCZ, on-site benefits and/or off-site spill-over benefits may occur.</p> <p>The extent of the possible additional benefits (over and above what is described above) due to the change in the conservation objective for moderate energy circalittoral rock is not clear.</p> <p>Confidence: Low</p>


Table 5b. Recreation	rMCZ Skerries Bank and Surrounds
Baseline	Beneficial impact under Policy Option 1
<p><b>Angling:</b> 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, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition.</p> <p>Charter boats are available for anglers to fish around Skerries Bank. The main species caught here is plaice. It has not been possible to estimate the value of</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of crawfish from the rMCZ.</p> <p>No change in feature condition or general harvesting of fish and shellfish, with the exception of crawfish which are not typically targeted by anglers, is anticipated and therefore no on-site or off-site benefits are expected.</p> <p>Designating the rMCZ will protect its features and the ecosystem services</p> <p>Anticipated direction of change: </p> <p>Confidence: Moderate</p>

Table 5b. Recreation	rMCZ Skerries Bank and Surrounds	
angling at the site.	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).	
	<b>Beneficial impact under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1)</p> <p>SNCBs advise that the conservation objective for moderate energy circalittoral rock is changed from “Maintain” to “Recover”. If the conservation objectives of the features are achieved, the area of moderate energy circalittoral rock habitat and the species crawfish will recover to favourable condition. Other site habitats and species will be maintained in favourable condition. New management of commercial fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b. Angling will be permitted within the site.</p> <p>Achievement of the conservation objectives may improve the contribution of moderate energy circalittoral rock 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, benefiting fish stocks.</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>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence:</p> <p style="text-align: center;">Low</p>

Table 5b. Recreation	rMCZ Skerries Bank and Surrounds	
<p><b>Diving:</b> Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition.</p> <p>There are a number of dive sites in the rMCZ, including draft and reef dives at Start Point, Lannacombe Bay, Prawle Point and Bolt Tail. It has not been possible to estimate the value of diving at the site.</p>	<b>Beneficial impacts under Policy Option 1</b>	
	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition (with the exception of crawfish, which are not typically a focus for divers).</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>
	<b>Beneficial impacts under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for moderate energy circalittoral rock is changed from “Maintain” to “Recover”. If the conservation objectives of the features are achieved, the area of moderate energy circalittoral rock habitat and the species crawfish will recover to favourable condition. Other site habitats and species will be maintained in favourable condition.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ Skerries Bank and Surrounds	
	<p>An improvement in the condition of site features, in particular moderate energy circalittoral rock habitat, 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><b>Wildlife watching:</b> Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish for which provision is commensurate to that when in unfavourable condition.</p> <p>There is a visitor centre at Prawle Point that houses a telescope which can be used to view wildlife. The coastline of the rMCZ is popular for bird watching.</p>	<b>Beneficial impacts under Policy Option 1</b>	
	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition (with the exception of crawfish, which are not typically a focus for wildlife watching).</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>
	<b>Beneficial impacts under Policy Option 2</b>	


Table 5b. Recreation	rMCZ Skerries Bank and Surrounds
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for moderate energy circalittoral rock is changed from “Maintain” to “Recover”. If the conservation objectives of the features are achieved, the area of moderate energy circalittoral rock habitat and the species crawfish 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, in particular moderate energy circalittoral rock habitat, and any associated increase in the 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:    Confidence:  Low</p>

Table 5c. Research and education	rMCZ Skerries Bank and Surrounds
Baseline	Beneficial impact under Policy Options 1 and 2

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5c. Research and education		rMCZ Skerries Bank and Surrounds
<p><b>Research:</b> 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 and monitoring activities take place in the rMCZ, typically focusing on the effects of the South Devon Inshore Potting Agreement and the Plymouth to Prawle Point Special Area of Conservation.</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><b>Education:</b> 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 a visitor centre at Prawle Point that houses interpretation boards and a telescope which can be used to view wildlife. The RSPB and Devon Wildlife Trust put on bird watching guided walks.</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 Skerries Bank and Surrounds
Baseline	Beneficial impact under Policy Option 1	
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> The features of the site contribute to the resilience</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. Crawfish will be recovered to 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>Anticipated direction of change:</p> <p>↑</p> <p>Confidence:</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5d. Regulating services		rMCZ Skerries Bank and Surrounds
<p>and continued regeneration of marine ecosystems. Rock habitats can support particularly high biodiversity (Fletcher and others, 2012).</p> <p><b>Natural hazard protection:</b> 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>	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).	Low
	<b>Beneficial impacts under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to draft conservation objectives under this Option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for moderate energy circalittoral rock is changed from “Maintain” to “Recover”. If the conservation objectives of the features are achieved, the area of moderate energy circalittoral rock habitat and the species crawfish will recover to favourable condition. Other site habitats and species will be maintained in favourable condition.</p> <p>It is not clear if there will be additional benefits from regulating services (due to the achievement of conservation objectives) over and above what are expected.</p>	<p>Anticipated direction of change: unclear</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Skerries Bank and Surrounds
Baseline	Beneficial impacts under Policy Options 1 and 2	



Table 5e. Non-use and option values	rMCZ Skerries Bank and Surrounds	
<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>Examples of these values are shown in Ranger and others (2012). Voters in the Marine Conservation Society 'Your Seas Your Voice' campaign expressed a desire to protect the area because of a personal affinity with the area and because 'the whole place is amazing' and has 'spectacular scenery'.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**rMCZ South Dorset****Site area (km<sup>2</sup>): 192.7**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts				rMCZ 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 rocky and mixed sediment sea-floor habitat, and includes several records of the Features of Conservation Importance habitat subtidal chalk. The rMCZ intersects with an area of higher than average benthic habitat diversity as well as persistent summer and winter fronts, which indicate high levels of productivity. The area of the rMCZ was highlighted as an area of high conservation utility within a Marxan (conservation planning software) analysis.</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
<i>Broad-scale Habitats</i>				
High energy circalittoral rock	30.62	-	Unfavourable Condition	Recover to Favourable Condition
Moderate energy circalittoral rock	7.43	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal coarse sediment	27.67	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mixed sediments	127.06	-	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
Subtidal chalk	-	4	Unfavourable Condition	Recover to Favourable Condition

**Option 2:** This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.

Subtidal chalk

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

Table 2a. Archaeological heritage		rMCZ South Dorset
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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 and Policy Option 2	
Three wrecks are recorded in the site (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impacts made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost of one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.	

Table 2b. Commercial fisheries	rMCZ South Dorset
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>	
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.	

Table 2b. Commercial fisheries		rMCZ South Dorset				
<b>Management scenario 1:</b> No additional management.						
<b>Management scenario 2:</b> Closure of areas of high energy circalittoral rock and moderate energy circalittoral rock to bottom trawls, dredges, pots and traps, nets, and hooks and lines.						
<b>Management scenario 3:</b> Closure of entire rMCZ to bottom trawls and dredges.						
<b>Management scenario 4:</b> 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 and Policy Option 2				
<b>Overview:</b> The majority of the rMCZ lies between the 6nm (nautical mile) and 12nm limits, with a small proportion inside 6nm, and as such different fisheries restrictions apply in different parts of the rMCZ (see Annex E). Potting accounts for the majority of the fishing effort in the rMCZ and there is a low level of bottom trawling, principally by French vessels. Estimated total value of UK vessel landings from the rMCZ: £0.040m/yr.						
<b>UK Dredges:</b> The rMCZ does not cover a known scalloping ground and the level of dredging in the rMCZ is currently very low. Estimated value of UK dredge landings from the rMCZ: £0.002m/yr.		<b>Scenario 1:</b> No impacts are anticipated under Scenario 1.				
		<b>Scenario 2:</b> The rMCZ is not currently a regular scalloping ground and average landings from it are low. No significant impacts are therefore anticipated under this scenario.				
		<b>Scenarios 3 and 4:</b> The rMCZ is not currently a regular scalloping ground and average landings from it are low. No significant impacts are therefore anticipated under these scenarios.				
		Estimated annual value of UK dredge landings affected is expected to fall within the following range:				
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
		Value of landings affected	0.000	0.002	0.002	0.002

Table 2b. Commercial fisheries		rMCZ South Dorset			
<b>UK Bottom trawls:</b> There is a low level of effort by UK trawlers in the rMCZ, which is located to the east of the main trawling grounds (MCZ Fisheries Model; South West Fishing Industry Group, 2011). Sole and cuttlefish are the key species targeted by trawlers. Estimated value of UK bottom trawl landings from the rMCZ: £0.010m/yr.	<b>Scenario 1:</b> No impacts are anticipated under Scenario 1.				
	<b>Scenario 2:</b> The value of landings affected by the rMCZ is low, at £0.004m/yr. No significant impacts are therefore expected under this scenario.				
	<b>Scenarios 3 and 4:</b> The rMCZ is not currently a regular fishing ground and there is no reason to expect this to change. It is anticipated that the current low level of bottom trawl effort in the site would be displaced as a result of either management scenario, and may be redirected to the more heavily fished grounds to the west of the rMCZ (Marine Management Organisation [MMO], pers. comm., 2012; South West Fishing Industry Group, 2011).				
	Estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Value of landings affected	0.000	0.004	0.010	0.010
<b>UK Pots and traps:</b> Local potters from the ports of Weymouth and Portland may fish within the rMCZ although their effort is concentrated to the north of the rMCZ, inside 6nm. The rMCZ is not thought to be a regular potting ground (MMO, pers. comm., 2012). The potting that does occur is concentrated over the hard ground at the western end of the rMCZ. Estimated value of UK bottom trawl landings from the rMCZ: £0.020m/yr.	<b>Scenarios 1 and 3:</b> No impacts are anticipated under Scenarios 1 and 3.				
	<b>Scenarios 2 and 4:</b> The rMCZ is not thought to be a regular fishing ground, although the value of landings affected is not insignificant. There may be displacement as a result of either management scenario..				
	Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Value of landings affected	0.000	0.019	0.000	0.020
	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 2b. Commercial fisheries		rMCZ South Dorset					
		range, and is likely to be less restrictive than that required for other gears.					
<b>UK Hooks and lines:</b> The rMCZ is not thought to be a regular fishing ground for hook and line fishers (MMO, pers. comm., 2012). Estimated value of UK hook and line landings from the rMCZ: £0.003m/yr.		<b>Scenarios 1, 2 and 3:</b> No impacts are anticipated under Scenarios 1, 2 and 3.					
		<b>Scenario 4:</b> The rMCZ is not a regular fishing ground. The value of landings affected is low and as such no significant impacts are anticipated under this scenario.					
		Estimated annual value of UK hook and line landings affected is expected to fall within the following range:					
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	
		Value of landings affected	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 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 and Policy Option 2							
<b>Total direct impact on UK commercial fisheries</b>		Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:					
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best Estimate
		Value of landings affected	0.000	0.025	0.012	0.034	0.003
		GVA affected	0.000	0.012	0.005	0.016	0.001
		The best estimate is based on an assumption on the likelihood of the lowest and highest					

Table 2b. Commercial fisheries		rMCZ South Dorset
		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><b>Impact on non-UK commercial fisheries under Policy Option 1 and Policy Option 2:</b> 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: £0.089m/yr; static gears: £0.000m/yr. Estimates are not available for other countries.</p>		<p><b>Scenario 1:</b> No impacts are anticipated under Scenario 1.</p> <p><b>Scenarios 2, 3 and 4:</b> Non-UK vessels using bottom trawls/dredges, including 14 French bottom trawlers, and static gears will be affected by the rMCZ. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be £0.089m/yr (bottom trawls/dredges) and £0.000m/yr (static gears). No information is available on the effect of the zoned closure to bottom trawls/dredges and static gears or on the value of landings of other country vessels.</p>

Table 2c. National defence		rMCZ South Dorset
<p><b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b></p> <p>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.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2	
MOD is known to make use of the rMCZ for aerial, surface, water column and practice landing activities. The rMCZ is in MOD exercise and danger areas.	It is not known whether this rMCZ will impact on MOD's activity. Impacts of rMCZs on MOD activities are assessed in Annex N and the Evidence Base. (They are not assessed for this rMCZ only.)	

Table 2d. Renewable energy		rMCZ South Dorset			
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>					
<b>Management scenario 1:</b> 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.					
<b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for licence applications and increase in cable protection costs for power export cables and inter-array cables in the rMCZ (relative to the mitigation provided in the baseline).					
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2			
<b>Tidal energy:</b> The rMCZ overlaps with the Portland tidal energy Potential Development Area (PDA) (PMSS, 2010). A potential installation could have a footprint within the PDA of 5km <sup>2</sup> . The rMCZ is situated away from the best areas of tidal energy resource within the PDA, which lie to the north of the rMCZ off Portland Bill. As such, any future development is unlikely to overlap with the area of the rMCZ. Given that the area of best tidal energy resource is landward of the rMCZ, it is unlikely that any cables related to the installation will be sought that would pass through the rMCZ. One potential energy installation is anticipated in the PDA, with the associated licence application expected in the period 2015 to 2020 (Department of Energy and Climate Change [DECC], pers. comm., 2011). The development in the PDA is expected to have a production capacity of 120MW by 2030 (PMSS, 2010).		<b>Tidal energy:</b> The estimated cost to renewable energy developers of this rMCZ is expected to fall within the following range of scenarios:			
		£m (one-off cost)	Scenario 1	Scenario 2	Best estimate
		Cost to the operator	0.013	0.013	0.012
		<b>Scenario 1:</b> The analysis assumes that the potential future tidal energy installation is planned in close proximity to, the rMCZ. As a result of the designation of the rMCZ, the potential licence application for the tidal energy installation will need to consider the possible effects of the construction and operational activities on the features protected by the rMCZ and the rMCZ conservation objectives. This is expected to result in an additional one-off cost of £0.013m in 2015 (based on an average cost provided by renewable energy sector developers; see Annex N for details).			
		<b>Scenario 2:</b> No cables routes are anticipated to be sought that pass through the rMCZ, so no additional costs (beyond those already set out under scenario 1) are anticipated under Scenario 2.			



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

<b>Table 3: Human activities in the site that are not negatively affected by the rMCZ under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ: South Dorset</b>
Commercial fishing (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 scale<sup>11</sup></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 Dorset	
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	BSH	✓	✓	✓	None	Recover				

<sup>11</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

circalittoral rock									
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓	None	Recover			
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	
A5.4 Subtidal mixed sediment	BSH	✓	✓	✓	None	Maintain	Site needed to meet minimum adequacy within the regional MCZ project.		
Subtidal chalk	FOCI Habitat	✓	✓	✓	Replication has not been met in the region* <sup>1</sup>	Recover	This is the only example of subtidal chalk within the		UK List of Priority Species and Habitats

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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

**Additional comments and site benefits:**

<sup>1</sup> However this feature is very limited in the region and so cannot have more replicates.

<sup>2</sup> This site is important in providing connectivity between the Finding Sanctuary and the Balanced Seas regional projects, particularly with regards to the subtidal chalk habitat.

Provides second largest quantity of subtidal mixed sediments in the Finding Sanctuary region.

Anecdotal evidence to suggest this area is important as a wintering ground for both species of seahorses, especially *Hippocampus hippocampus*. (SAD in (Lieberknecht, et al. 2011)).

Finding Sanctuary describe that this area intersects with an area of higher than average benthic habitat diversity, and was highlighted as an area of high conservation utility within an analysis using the Marxan GIS tool, carried out for the Inshore Working Group in the summer of 2010. (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 South Dorset
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 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, some features will be recovered to favourable condition. Others will be maintained in favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b.</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>It is unclear whether the scale of habitat recovered and the magnitude of</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 Dorset
	<p>reduced (on-site) harvesting will be enough to have any significant positive impact on commercial stocks of mobile species. Low mobility and site-attached species populations, such as crab and lobster, may improve as a result of improved habitat condition and reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ.</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 Dorset
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Angling:</b> Fletcher and others (2012) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of service provided is assumed to be commensurate with that provided by the features of the site when in favourable and unfavourable condition (see Table 1b).</p> <p>Angling from charter boats occurs occasionally within the rMCZ. This site is not considered to be that good for angling, and charter boat skippers rarely visit the area, preferring other marks on the Dorset coastline (Weymouth &amp; Portland Licensed Skippers Association, pers. comm., 2011). A new bass mark has, however, been recently identified within the rMCZ. It has not been possible to estimate the value of angling in the site.</p>	<p>If the conservation objectives of the features are achieved, some features will be recovered to favourable condition. Others will be maintained in favourable 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>If the rMCZ results in an increase in the size and diversity of species caught by anglers then this is expected to improve the quality of angling at the site and therefore the value of the ecosystem service.</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><b>Diving:</b> Diving is not known to take place in the rMCZ.</p>	N/A	N/A

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5b. Recreation		rMCZ South Dorset
<b>Wildlife watching:</b> Wildlife watching is not known to take place in the rMCZ.	N/A	N/A

Table 5c. Research and education		rMCZ South Dorset
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> 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><b>Education:</b> 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 Dorset
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5d. Regulating services		rMCZ South Dorset
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> 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><b>Natural hazard protection:</b> As the site is offshore it is unlikely to contribute to natural hazard 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 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 South Dorset
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 South-West Deep (West)****Site area (km<sup>2</sup>): 1,824.3**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts				rMCZ South-West Deeps (West)
1a. Ecological description				
The western boundary of this site follows the UK Continental Shelf Limit. The site comprises an area of continental shelf sea where the sea-floor habitat is dominated by subtidal mixed sediment and subtidal sand. The eastern site boundary is approximately 230km south-west of Land’s End. The depth of the site is between 100 and 200 metres. 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). The area has also been highlighted as a foraging ground for sea birds during the summer (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	239.40	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	1574.27	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal mixed sediments	6.99	-	Unfavourable Condition	Recover to Favourable Condition
<i>Geological and Geomorphological Features of Interest</i>				
Celtic sea relict sandbanks	132.90	-	Favourable Condition	Maintained at Favourable Condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Subtidal sand, Celtic sea relict sandbanks				

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

<b>Table 2a. Commercial fisheries</b>	<b>rMCZ South-West Deep (West)</b>
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Table 2a. Commercial fisheries		rMCZ South-West Deeps (West)				
Source of costs of the rMCZ under Policy Option 1 and Policy Option 2						
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 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 and Policy Option 2				
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 and covers more than 10% of International Council for the Exploration of the Sea [ICES] Rectangles 27E0 and 27E1 and less than 10% of ICES Rectangle 26E0. French and Spanish vessels are active throughout the wider area (defined as the 3 ICES Rectangles 27E0 (MMO, 2011). Bottom trawling, by UK and French vessels, and mid-water trawling are the main types of fishing in the rMCZ, although there is also a low level of fishing with hooks and lines and nets (MCZ Fisheries Model). Estimated total value of UK vessel landings from the rMCZ: £0.109m/yr.						
UK Bottom trawls: The rMCZ lies on the southern edge of a significant area of trawling activity. Vessels target a large area running north of the rMCZ up towards the south-west coast of Ireland, principally fished by otter trawl vessels of between 30 and 40 metres targeting megrim, monkfish and angler fish (MMO, 2011). The eastern half of the rMCZ is the most heavily fished part of the rMCZ and trawls in the area typically run in a south-west/north-east direction (Lee, 2010). Estimated value of UK bottom trawl landings from the rMCZ: £0.097m/yr.		Scenario 1: No impacts are anticipated under Scenario 1.				
		Scenarios 2, 3 and 4: The small proportion of the fishery described in the baseline that is covered by the rMCZ indicates that displaced vessels would be likely to target the fishing ground outside the rMCZ. The displacement of fishing effort may have knock-on consequences for fishing outside 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	Scenario 3	Scenario 4
		Value of landings affected	0	0.097	0.097	0.097

Table 2a. Commercial fisheries		rMCZ South-West Deeps (West)																					
<b>UK Nets:</b> There is sporadic gill netting in the rMCZ, but the overall netting effort is low. Estimated value of UK net landings from the rMCZ: £0.001m/yr.	<b>Scenarios 1 and 2:</b> No impacts are anticipated under scenarios 1 and 2.																						
	<b>Scenarios 3 and 4:</b> 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.																						
	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>0.000</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	0.000	0.001								
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4																			
Value of landings affected	0.000	0.000	0.000	0.001																			
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 and Policy Option 2																							
<b>Total direct impact on UK commercial fishing</b>	Estimated annual value of UK vessel landings and gross value added (GVA) affected:																						
	<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>0.097</td><td>0.097</td><td>0.098</td><td>0.012</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.040</td><td>0.040</td><td>0.041</td><td>0.005</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate	Value of landings affected	0.000	0.097	0.097	0.098	0.012	GVA affected	0.000	0.040	0.040	0.041	0.005
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate																	
	Value of landings affected	0.000	0.097	0.097	0.098	0.012																	
GVA affected	0.000	0.040	0.040	0.041	0.005																		
The best estimate is based on an assumption of the likelihood of the lwoest and highest cost scenario occuring, 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.																							
<b>Impact on non-UK commercial fishing:</b> Non-UK vessels using bottom		<b>Scenario 1:</b> No impacts are anticipated under Scenario 1																					

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 2a. Commercial fisheries	rMCZ South-West Deep (West)
<p>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: £0.014m/yr; static gears: £0.022m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.</p>	<p><b>Scenarios 2, 3 and 4:</b> Non-UK vessels using static gears and bottom trawls/dredges, in particular French and Spanish bottom trawlers and Spanish longliners, would be affected by the rMCZ. The rMCZ would result in the displacement of trawling and long line 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 £0.014m/yr (bottom trawls/dredges) and £0.022m/yr (static gears). No information on the effect of the zoned closure to static gears or the impact on Spanish vessels' value of landings is available.</p>

Table 2b. National defence	rMCZ South-West Deep (West)
<p><b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b></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 and Policy Option 2
<p>MOD is known to make use of the rMCZ for water column activities. The rMCZ is in an MOD 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 that are assessed for the suite of MCZs under Policy Option 1 and Policy Option 2 and not for this site alone	rMCZ South-West Deep (West)
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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 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ South-West Deeps (West)
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 <sup>12</sup>										rMCZ West (West)	South-Deeps
✓ = 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	Represent-	Replication	Adequacy	Viability	Gaps shortfalls or in	Recommended conservation	Quantitative considerations at	Ecological Importance at	Ecological Importance at		

<sup>12</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Feature	activity				relation to ENG minimum guidelines	objective	regional MCZ level	regional MCZ level	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	Out of all of the rMCZs and existing MPAs, this site contributes the second largest area of subtidal sand	Only a small proportion of this feature is captured in existing MPAs	Out of all of the rMCZs and existing MPAs, this site contributes the second largest area of subtidal sand in the Western Channel and Celtic Sea

Annex I2. Site specific *Impact Assessment materials (Option 2)*

									Regional Sea
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A5.4 Subtidal mixed sediments	BSH	✓	✓	✓	None	Recover			
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				Marine process feature - Celtic Sea Relict Sandbanks * <sup>2</sup>					
Appropriate boundary				✓					
Areas of additional ecological importance				✓ * <sup>3</sup>					

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Overlaps with existing MPAs	None
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**Additional comments and site benefits:**

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

<sup>2</sup> This site has been proposed for its geological/geomorphological significance to provide protection for the Celtic Sea Relict Sandbanks, a marine process feature, which was listed as a feature of interest in the ENG. 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.

<sup>3</sup> 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-West Deeps (West)
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 habitats will be recovered to favourable condition and the geological features 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 Deepes (West)
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
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 Deepes (West)
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> 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><b>Education:</b> 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 (West)
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> 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><b>Natural hazard protection:</b> 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>If the conservation objectives 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 South-West Deeps (West)
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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>

Table 5e. Non-use and option values	rMCZ South-West Deepes (West)
rMCZ Tamar Estuary Sites	Site area (km <sup>2</sup> ): 15.3

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, draft conservation objectives for some features in this site have been changed from those established by the Regional Projects. These changes and their impacts on management and costs are reflected under Policy Option 2.

Table 1. Conservation impacts	rMCZ Tamar Estuary Sites
<b>1a. Ecological description</b>	
<p>This site consists of two spatially separate component areas. The upper Tamar and Tavy estuaries form one part, along the mean high water mark from Gunnislake to just north of the Tamar Bridge at Saltash. The second part consists of the Lynher Estuary with its smaller tributaries, along the mean high water mark from the tidal limits at Tideford and north of Landrake to Jupiter Point near the mouth of the Lynher. The site is included within the Plymouth Sound and Estuaries Special Area of Conservation and overlaps with the Tamar Estuaries complex Special Protection Area and a number of Sites of Special Scientific Interest.</p> <p>The Tavy's intertidal mudflats in the upper estuary consist predominantly of silt and clay. In the central and upper estuary, superficial bed sediments in the main channel, and on the upper shores of both banks when these are not saltmarsh, comprise a mixture of predominantly coarse, non-cohesive sediments with very small fractions of silt and clay. There are extensive mudflats on the western shore of the Hamoaze, in the Lynher Estuary.</p> <p>There are blue mussel beds in the recommended Marine Conservation Zone, present on intertidal sediment flats in the Lynher and Hamoaze. Surveyed beds were colonised by <i>Elminius modestus</i> with generally frequent <i>Littorina saxatilis</i> and <i>Littorina littorea</i>. <i>Cerastoderma edule</i> were also present. Attached algae or algae living on stones among the mussels included <i>Fucus vesiculosus</i> and <i>Ascophyllum nodosum</i>. On the lower shore at Jupiter Point, mussels are colonised by filamentous red algae and by abundant <i>Halichondria</i> spp. and <i>Bowerbankia imbricata</i> as well as occasional <i>Crepidula fornicata</i> and <i>Myxilla incrustans</i>.</p> <p>Native oyster <i>Ostrea edulis</i>, blue mussel <i>Mytilus edulis</i> and European eel <i>Anguilla anguilla</i> are all present in the estuary. The area is of particular importance for smelt <i>Osmerus eperlanus</i>, with successful spawning events and indications of an established population being reported since the 1970s. The estuary serves an important ecological function as a nursery area.</p> <p>A well developed estuarine gradient and the presence of littoral and sublittoral hard strata are the important features in the Tamar Estuary. The rarely encountered hydroid <i>Cordylophora caspia</i> has been recorded in high densities. Where the estuary opens out at Weir Quay, the polyhaline <i>Hartlaubella gelatinosa</i> has been recorded on shells and other hard strata. In the area off Ballast Punt, Torpoint, low shore shale cobbles and boulders support a rich assemblage of finely branching algae and a rich underboulder fauna. The cobbles and boulders on mud extend into the sublittoral.</p> <p>Reef habitats occur within the Plymouth estuaries, comprising intertidal and subtidal low energy reefs, including some composed of limestone. This relatively soft rock is</p>	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

extensively bored by the bivalve *Hiattella arctica* and the spionid worms *Polydora* spp., and harbours a rich fauna. In the sublittoral this steep-sided reef is dominated by a dense hydroid and bryozoan turf interspersed with anemones and ascidians. The sublittoral is of particular importance for its kelp- and animal-dominated habitats. Abundant populations of the slow-growing, long-lived, nationally important pink sea-fan *Eunicella verrucosa* also occur at this site.

*Spartina anglica* saltmarsh is present in the Tavy, and *Phragmites australis* beds on the upper tidal river banks of the Tamar at Calstock. The Tamar estuaries are also important for both species of seahorse (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>				
Intertidal biogenic reefs	0.01	-	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for intertidal biogenic reefs is changed from “Maintain” to “Recover to Favourable Condition”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
Intertidal coarse sediment	0.04	-	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for intertidal coarse sediment is changed from “Maintain” to “Recover to Favourable Condition”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
<i>Habitats of Conservation Importance</i>				
Blue mussel beds	-	1	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for intertidal blue mussel beds is changed from “Maintain” to “Recover to Favourable Condition”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
<i>Species of Conservation Importance</i>				
<i>Ostrea edulis</i>	-	4	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for the Native oyster (<i>Ostrea edulis</i>) is changed from “Maintain” to “Recover to Favourable Condition”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
<i>Osmerus eperlanus</i>	-	-	To be determined	To be determined
<b>SNCBs advise that the conservation objective for smelt (<i>Osmerus eperlanus</i>) is “Recover to Favourable Condition”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
<i>Anguilla anguilla</i>	-	-	To be determined	To be determined
<b>SNCBs advise that the conservation objective for the European eel (<i>Anguilla anguilla</i>) is “Recover to Favourable Condition”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.				

Native oyster (*Ostrea edulis*) and European eel (*Anguilla anguilla*)**Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)**

<b>Table 2a. Archaeological heritage</b>		<b>rMCZ Tamar Estuary Sites</b>
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>		
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.		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector under Policy Options 1 and 2</b>	
A large number of industrial structures can be found in the site including an Okeltor 19th century arsenic, copper and tin mine, along with a lime kiln with adjacent buildings. Peat is also recorded for this site. English Heritage has indicated that this site is likely to be of interest for archaeological excavation in the future as it is relevant to its National Heritage Protection Plan (theme 3A1.2) (English Heritage, pers. comm., 2012).	An extra cost would be incurred in the assessment of environmental impact made in support of any future licence applications for archaeological activities in the site. The likelihood of a future licence application being submitted is not known, so no overall cost to the sector of this rMCZ has been estimated. However, the additional cost of one licence application could be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.	

<b>Table 2b. Flood and coastal erosion risk management (coastal defence)</b>		<b>rMCZ Tamar Estuary Sites</b>
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>		
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.)		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector under Policy Options 1 and 2</b>	
The 0 to 20 year Shoreline Management Plan policies along the shoreline of the rMCZ are for 'no active intervention' along undefended frontages and to investigate the feasibility of 'managed realignment' in other places. Where managed realignment is not possible, the policy is to 'hold the line' of existing	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	

Table 2b. Flood and coastal erosion risk management (coastal defence)		rMCZ Tamar Estuary Sites
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>		
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 Options 1 and 2	
defences. Schemes may come forward as a result of the hold-the-line policy (Environment Agency, pers. comm., 2012).	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. Ports, harbours, shipping and disposal sites		rMCZ Tamar Estuary Sites	
<b>Source of costs of the rMCZ under Policy Options 1 and 2</b>			
<b>Management scenario 1:</b> 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.			
<b>Management scenario 2:</b> 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.			
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Options 1 and 2	
<u>Harbour development:</u> Devonport naval base and dockyard is within 5km of the rMCZ. There are no known plans for development.	£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.		

Table 2c. Ports, harbours, shipping and disposal sites	rMCZ Tamar Estuary Sites
	<p><b>Scenario 1:</b> No costs are anticipated under this scenario.</p> <p><b>Scenario 2: <i>Harbour developments</i>:</b> 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 2d. Other impacts that are assessed for the suite of MCZs under Policy Options 1 and 2 and not for this site alone	rMCZ Tamar Estuary Sites
<p><b>Cables (interconnectors and telecom cables):</b> 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>	

Table 2e. Commercial fisheries	rMCZ Tamar Estuary Sites
<p><b>Source of costs of the rMCZ Policy Option 2</b></p> <p><b>Policy Option 1</b> No management anticipated, based on the Regional Project draft Conservation Objectives (and therefore no costs are anticipated).</p> <p><b>Policy Option 2</b> 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><b>Management scenario 1:</b> No additional management.</p>	

Table 2e. Commercial fisheries		rMCZ Tamar Estuary Sites
<b>Management scenario 2:</b> Closure of entire MCZ to all commercial fishing		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 2	
Data suggests that there may be low levels of fishing activity for bottom trawling in the site, and there may be hand collection as well.	The change in conservation objective for this site (and all features within the site, including Blue Mussel Beds/biogenic reefs) were recommended to change from “maintain” to “recover” based on water quality issues flagged for the estuary and not due to fishing activity pressures. This means that it is anticipated that there are no additional management costs for fishing activities due to this change in conservation objective.	

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

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Tamar Estuary Sites
Cables (existing interconnectors and telecom cables); commercial fisheries (collection by hand); recreation; 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 <sup>13</sup>	rMCZ Tamar Estuary Sites
✓ = 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	

<sup>13</sup> copied from the JNCC and Natural England’s advice to Defra on rMCZs



Annex I2. Site specific *Impact Assessment materials (Option 2)*

(*) 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
A2.7 Intertidal biogenic reefs	BSH	✓ * 1	✓	✓	None	Maintain	This rMCZ is the only site in FS region with this feature* <sup>1</sup>	This rMCZ is the only site in FS region with this feature* <sup>1</sup>	
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
Blue mussel beds <i>Mytilus edulis</i>	FOCI Habitat	✓ * 2	✓	X	None	Maintain			
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓	None	Maintain			
Smelt <i>Osmerus eperlanus</i>	FOCI Mobile species	✓	✓	N/A	None	Maintain/Recover	Tamar is the only site in the region with Smelt listed	Tamar is the only site in the region with Smelt listed	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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 reaching the minimum replication target	BAP species and IUCN red data book listed.	BAP species and IUCN red data book listed.
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓					
Overlaps with existing MPAs				✓					

**Additional comments and site benefits:**

<sup>1</sup> Although the Tamar is the only site which is listed for BSH intertidal biogenic reef in the Finding Sanctuary region, the ENG (Table 6) lists BSH for which replication, viability and connectivity guidelines will be used to meet the principles of adequacy, and that all of these (except BSH Deep-sea bed) should be assigned component FOCI habitats. For BSH Intertidal biogenic reefs these are the intertidal honeycomb worm (*Sabellaria alveolata* reefs), and intertidal blue mussel beds. There are over 5 replicates for both these FOCI habitats, so replication is met for the BSH.

<sup>2</sup> There are only three replicates including one existing MPA.

Expert opinion from the EA is that it is a spawning ground [for smelt], and the only known one in the SW region.

## Annex I2. Site specific *Impact Assessment materials (Option 2)*

This MCZ is subject to monitoring by the EA and by Natural England due to the current SAC designation, and WFD requirements and therefore it has a recent history of scientific research.

The site supports a number of other habitats such as coastal salt marshes and saline reedbeds and seagrass ((Mapping European Seabed Habitats project (MESH), (ABPmer 2009a, Lieberknecht, et al. 2011)).

This MCZ intersects with 3.67km<sup>2</sup> of polygonal data which The Seahorse Trust provided to Finding Sanctuary showing likely areas of seahorses across the South -west region.

The main reason for inclusion of this site, in addition to existing designations, is in recognition of the ecological importance of the estuary as a nursery area and use by mobile species (SAD in (Lieberknecht, et al. 2011)).

The upper reaches of the estuary which the rMCZ covers are internationally important for wintering wild fowl and waders, including the Avocet.

Biogenic reefs play an important role in primary biomass production, and provide a hard substrate and range of microhabitats for colonisation by other organisms. They also provide a significant amount of resistance to wave energy, attributing to coastal protection.

Mussel reefs are also an important food source for birds and have a strong stabilising effect on the sediment, thereby countering erosive wave action.

### 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 can be found in Annex H.

Table 5a. Fish and shellfish for human consumption		rMCZ Tamar Estuary Sites
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5a. Fish and shellfish for human consumption	rMCZ Tamar Estuary Sites	
<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 Tamar Estuary Sites	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Angling:</b> 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. 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 level of angling in this site is unknown. 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. 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>
<p><b>Diving:</b> Diving is not known to take place in the rMCZ.</p>	<p>N/A</p>	<p>N/A</p>



Table 5b. Recreation	rMCZ Tamar Estuary Sites	
<p><b>Wildlife watching:</b> 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 one of the largest mudflats in the South-West and home to a variety of bird species including kingfishers, shelducks and a large wintering population of avocets. The Tamar Estuary Nature Reserve provides a viewpoint and hides for bird watching.</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 style="text-align: center;"></p> <p>Confidence: Moderate</p>
	<b>Beneficial Impacts under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this Option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for the European eel (<i>Anguilla anguilla</i>) and Smelt (<i>Osmerus eperlanus</i>) are set to “recover”, while the conservation objective for blue mussel beds, intertidal biogenic reefs, intertidal coarse sediment and the Native oyster (<i>Ostrea edulis</i>) be changed from “maintain” to “recover”. The designation of/change in conservation objectives for these features are due to water quality and not due to pressures from wildlife watching, which means that there will be no additional management of this activity.</p> <p>The estuary is one of the largest mudflats in the South-West and home to a variety of bird species, and the Tamar Estuary Nature Reserve provides a viewpoint and hides for bird watching. None of the features whose conservation objectives have changed or have been set are bird species. However, several of these features act as food sources for these birds,</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ Tamar Estuary Sites	
	which mean that they indirectly contribute to the ecosystem service. If the conservation objectives for these features are achieved, then there could be an improvement in this ecosystem service. However, this improvement may not necessarily be additional to what is already expected from the designation of the site as an rMCZ.	

Table 5c. Research and education	rMCZ Tamar Estuary Sites	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> 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>Baseline and research projects are carried out in the area of the rMCZ under the Tamar Estuary Consultative Forum (TECF) which manages the Plymouth Sound and Estuaries European Marine Site. A number of research objectives and actions are set out in the Tamar Estuaries Management Action Plan (TECF, 2006). TECF has proposed a project to look at the potential role of Marine Protected Area management in the local area. The extent of other 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 style="text-align: center;">↑</p> <p>Confidence: High</p>

Table 5c. Research and education	rMCZ Tamar Estuary Sites	
<p><b>Education:</b> 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 number of organisations currently provide education resources and events relating to the estuary and the area receives high numbers of visitors. The Tamar Estuaries Management Action Plan includes a number of objectives and actions to further improve and co-ordinate the provision of education (TECF, 2006). 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 style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services	rMCZ Tamar Estuary Sites	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> 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. Native oyster beds sequester carbon and filter algae and sediment from the water (Fletcher and others, 2012).</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012).</p> <p><b>Natural hazard protection:</b> 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 style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values	rMCZ Tamar Estuary Sites
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Table 5e. Non-use and option values		rMCZ Tamar Estuary Sites
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
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 because of the biodiversity and scenery, and a personal connection with the site. They also expressed a desire to see the threatened habitat protected so that wildlife could recover.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>



**rMCZ The Canyons****Site area (km<sup>2</sup>): 660.58**

- This site has been proposed for designation under Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts				rMCZ The Canyons
1a. Ecological description				
<p>This site is located in the far south-west corner of the UK’s continental shelf area and is more than 330km from Land’s End. The area is unique within the context of England’s extensive but largely shallow shelf seas. It is located on the continental shelf break, which drops steeply from the continental shelf to the oceanic abyss. The depth within the site ranges from 200 metres at the eastern edge to 2,000 metres in the west. Within the site, there are two large canyons that indent the shelf break, further adding to the topographic complexity of the sea floor.</p> <p>The recommended Marine Conservation Zone includes small slivers of continental shelf broad-scale habitats along the eastern boundary, in addition to the deep-sea broad-scale habitat beyond the shelf break. It covers a range of sea-floor habitats, including bedrock and a range of sediments varying from mud to coarse sediments.</p> <p>There is a small patch of live deep-water coral reef (<i>Lophelia pertusa</i> reef), located on the northern flank of the northernmost canyon in the site. This is the only living deep-water coral reef recorded within England’s seas (other deep-water coral reefs occur along the continental shelf break off Scotland and Ireland). There are more extensive patches of biogenic rubble present in the site, on the shallower spurs separating the deep canyons. This is an indication that the coral reef habitat may have been much more extensive in the past.</p> <p>The site also covers an area of additional ecological importance in terms of its pelagic environment. There is upwelling of deep, nutrient-rich waters along the shelf break, as is indicated by persistent sea surface temperature fronts located along the sea surface above the shelf break. The area attracts higher than average numbers of sea birds and cetaceans (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>				
Deep sea bed	655.54	-	Unfavourable Condition	Recover to Favourable Condition
Deep Circalittoral Coarse Sediment	5.22	-	-	-
Deep-Sea Bedrock	27.93	-	-	-
Deep-Sea Biogenic Gravel	57.08	-	-	-
Deep-Sea Mixed Substrata	160.37	-	-	-
Deep-Sea Mud	114.46	-	-	-

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Deep-Sea Sand	15.24	-	-	-
Communities of Deep-Sea Corals	0.17	-	-	-
Subtidal coarse sediment	0.12	-	Unfavourable Condition	Recover to Favourable Condition
Subtidal sand	3.95	-	Unfavourable Condition	Recover to Favourable Condition
<i>Habitats of Conservation Importance</i>				
Cold-water coral reefs	-	1	Unfavourable Condition	Recover to Favourable Condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Deep sea bed and Cold-water coral				

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

Table 2a. Commercial fisheries		rMCZ The Canyons
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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.		
<b>Management scenario 1:</b> Zoned closure of area of cold-water coral reef to dredges, bottom trawls, pots and traps, nets, and hooks and lines.		
<b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls and dredges; zoned closure of area of cold-water coral reef to pots and traps, nets, and hooks and lines.		
<b>Management scenario 3:</b> 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 and Policy Option 2
<b>Overview:</b> The rMCZ is close to the south-western edge of the UK’s 200nm (nautical mile) fishery limit and exclusive economic zone and is wholly within International Council for the Exploration of the Sea (ICES) Rectangle 25E0. Fishing in the rMCZ is primarily by hook and line and mid-water trawl (Mid-water trawl owner, pers. comm., 2011). Hook and line vessels active in the wider area (defined as ICES Rectangle 25E0) are predominantly Spanish, while mid-water trawls are from both the UK and France (MMO, 2011a). Fishing by both gears targets the area along the edge of the shelf break, which runs roughly north–south through the middle of the rMCZ (Mid-water trawl owner, pers. comm., 2011; South West Fishing Industry Group, 2011).		
Estimated total value of UK vessel landings from the rMCZ: £0.028m/yr.		

Table 2a. Commercial fisheries		rMCZ The Canyons			
<b>UK Bottom trawls:</b> UK vessels that bottom trawl in the wider area all use otter trawls, are over 30 metres in length (MMO, 2011a), and may fish inside the rMCZ. The vessels fish over large ranges, extending from the north coast of Spain northwards towards the Faroe Islands. The MCZ Fisheries Model indicates that only a very low level of effort occurs within the rMCZ. Vessels fishing in the area target megrim and monkfish/angler fish. Estimated value of UK bottom trawl landings from the rMCZ: £0.004m/yr.	<b>Scenario 1:</b> The zone is small, with an area of approximately 1km <sup>2</sup> , and does not cover the main focus of fishing effort in the area; there were no UK landings from the rMCZ between 2007 and 2010. No significant impacts are therefore expected.				
	<b>Scenarios 2 and 3:</b> Under these scenarios there may be displacement of effort from the rMCZ into the surrounding area of the fishery. Overall, the value of UK bottom trawl landings from the rMCZ was low and no significant impacts are expected.				
	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	
<b>UK Nets:</b> There is a very low level of activity by UK netters in the rMCZ. Fishers active in the wider area principally use set gill nets to target monkfish and angler fish (MMO, 2011a). Vessels fish along the shelf break, which runs through the rMCZ in roughly a north–south direction, and are active over large ranges extending from the north coast of Spain to the Faroe Islands (MMO, 2011a). Estimated value of UK net landings from the rMCZ: <£0.002m/yr.	<b>Scenarios 1 and 2:</b> The area proposed for closure covers a small proportion of the fishing grounds targeted by the affected vessels (MMO, 2011a). The affected value of landings is small and no significant impacts are anticipated.				
	<b>Scenario 3:</b> The scenario will close the whole of the rMCZ to netting. The area proposed for closure covers a small proportion of the fishing grounds targeted by the affected vessels (MMO, 2011a). The affected value of landings is small and no significant impacts are anticipated.				
	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	0.001	

Table 2a. Commercial fisheries		rMCZ The Canyons																		
<b>UK Hooks and lines:</b> UK hook and line activity is focused on set long lines to target hake (MMO, 2011a). Vessels fish along the shelf break, which runs through the rMCZ in roughly a north–south direction, with the fishers active over large ranges extending from the north coast of Spain to the Faroe Islands (MMO, 2011a). Estimated value of UK hook and line landings from the rMCZ: £0.011m/yr.	<b>Scenarios 1 and 2:</b> The area proposed for closure covers a small proportion of the fishing grounds targeted by the affected vessels (MMO, 2011a). The affected value of landings is small and no significant impacts are anticipated.																			
	<b>Scenario 3:</b> The scenario will effectively close the whole of the rMCZ to hook and line fishing. The area proposed for closure covers a small proportion of the fishing grounds targeted by the affected vessels (MMO, 2011a). The affected value of landings is relatively small.																			
	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 colspan="2">Scenario 3</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td colspan="2">0.006</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3		Value of landings affected	0.000	0.000	0.006						
£m/yr	Scenario 1	Scenario 2	Scenario 3																	
Value of landings affected	0.000	0.000	0.006																	
Total direct impact under Policy Option 1 and Policy Option 2																				
<b>Total direct impact on UK commercial fishing</b>	Estimated annual value of UK vessel landings and gross value added (GVA) affected:																			
	<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>0.017</td><td>0.002</td></tr><tr><td>Value of GVA affected</td><td>0.000</td><td>0.002</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	0.004	0.017	0.002	Value of GVA affected	0.000	0.002	0.009	0.001
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Best Estimate															
	Value of landings affected	0.000	0.004	0.017	0.002															
Value of GVA affected	0.000	0.002	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 an under- or over-estimate for this site.																				

Table 2a. Commercial fisheries	rMCZ The Canyons
<p><b>Impact on non-UK commercial fishing:</b> Non-UK vessels using static gears, bottom trawls/dredges and mid-water trawls, including Spanish demersal longliners and French demersal trawlers, fish within the rMCZ (Lee, 2010). Fishing effort by Spanish longliners is estimated to have totalled 900 fishing days in 2010. Fishing effort is thought to have declined over the last 10 years. All vessels are at least 24 metres in length and the principal target species is hake (ANASOL, OPPAO, OPP-7 and Puerto de Caleiro, pers. comm., 2011).</p> <p>Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.309m/yr; static gears: £0.072m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates for other countries are not available.</p>	<p><b>Scenarios 1, 2 and 3:</b> Non-UK vessels using static gears, bottom trawls/dredges, including French demersal trawlers and Spanish longliners, will be affected by the rMCZ. The rMCZ will result in the displacement of longline fishing effort equating to 900 fishing days/yr. This may have unknown knock-on impacts (ANASOL, OPPAO, OPP-7 and Puerto de Caleiro, pers. comm., 2011).</p> <p>In the event of a full closure of the rMCZ, the estimated value of French landings affected will be: £0.309m/yr (bottom trawls/dredges) and £0.072m/yr (static gears). No information on the effect of the zoned closure to bottom trawls/dredges and static gears or the impact on Spanish vessel value of landings is available.</p>

Table 2b. National defence	rMCZ: The Canyons
<p><b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b></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 and Policy Option 2
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 Policy Option 2 and not for this site alone	rMCZ The Canyons
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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).

**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 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ The Canyons
Cables (existing interconnectors and telecom cables); commercial fisheries (mid-water trawls); 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 scale<sup>14</sup></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 The Canyons
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<sup>14</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

ENG Feature	Represent- ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ project level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
Cold-water coral reef	FOCI	✓ * 1	✓ * 1	✓	None	Recover		This is the only site proposed for this feature within the region. This feature is not protected within existing MPAs. This feature has limited distribution.	This is a BAP and OSPAR habitat.  This is the only site recommended for this feature within the Western Channel and Celtic Sea Regional Sea and whole MCZ project area. This feature has limited distribution in the whole MCZ project area.
A5.1 Subtidal coarse sediment									
A5.2 Subtidal sand									
A6 Deep-sea bed	BSH	✓ * 2	✓ * 2	✓	None	Recover	Out of all of the rMCZ and existing MCZs this rMCZ	This feature is not protected within existing MPAs.	This feature is not protected within existing MPAs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

							contributes the largest area of deep-sea bed.	This feature has limited distribution.  This rMCZ one of only two examples of this habitat proposed for designation	and 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				✓ * 3					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of additional ecological importance				✓ * 4					
Overlaps with existing MPAs				None					

**Additional comments and site benefits:**

<sup>1</sup> There is only one example for cold-water coral reefs in the whole MCZ project area because it has limited distribution and only occurs in the far south-west of the MCZ project area.



<sup>2</sup> 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.

<sup>3</sup> 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.

<sup>4</sup> 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). It is also the only site within the regional MCZ project area, Western Channel and Celtic Sea region and the whole MCZ project area that would provide protection for the FOCI cold-water coral reefs, a BAP and OSPAR habitat. This feature has limited distribution in the whole MCZ project area, and is not currently protected in existing MPAs in the whole MCZ project area.

There is good evidence for the presence of a wide range of habitats within the deep-sea bed broad-scale habitat which have been mapped by JNCC, including communities of deep-sea corals, deep circalittoral coarse sediment, deep-sea bedrock, biogenic gravel, mixed substrata, mud and sand. 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 (200–2000m). This range of depths creates heterogeneous seafloor topography within the site.

## 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 The Canyons
Baseline	Beneficial impact Policy Option 1 and Policy Option 2	
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	<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</p>	<p>Anticipated direction of change:</p> <p>↔</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5a. Fish and shellfish for human consumption		rMCZ The Canyons
that provided by the features of the site when in unfavourable condition (see Table 1b).  A description of on-site fishing activity and the value derived from it is set out in Table 2a.	of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks.  As most of the commercial species targeted by fishers in this area are mobile finfish, it is unclear whether the scale of habitat recovered and the magnitude of reduced (on-site) harvesting will be enough to have any significant positive impact on commercial stocks.	Confidence: Low

Table 5b. Recreation		rMCZ The Canyons
Baseline	Beneficial impact Policy Option 1 and Policy Option 2	
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 The Canyons
Baseline	Beneficial impact Policy Option 1 and Policy Option 2	
<p><b>Research:</b> 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>Detailed survey mapping of an area of shelf break within the rMCZ has been undertaken by the Joint Nature Conservation Committee.</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><b>Education:</b> Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p>	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 change:

Annex I2. Site specific *Impact Assessment materials (Option 2)*


Table 5c. Research and education		rMCZ The Canyons
No known education activity is focused on the area of the rMCZ.	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).	 Confidence: Low


Table 5d. Regulating services		rMCZ The Canyons
Baseline	Beneficial impact Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> The features of the site contribute to the bioremediation of waste and sequestration of carbon. The deep-sea bed acts as an unrivalled reservoir for sequestration of CO<sub>2</sub>. 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><b>Environmental resilience:</b> 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><b>Natural hazard protection:</b> 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>	Anticipated direction of change:  Confidence: Low

Table 5e. Non-use and option values		rMCZ The Canyons
Baseline	Beneficial impact Policy Option 1 and Policy Option 2	

Table 5e. Non-use and option values	rMCZ The Canyons
<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 The Manacles****Site area (km<sup>2</sup>): 3.5**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, draft conservation objectives for some features have been changed from those established by the Regional Projects. These changes and their impacts on management and costs are reflected under Policy Option 2.

Table 1. Conservation impacts				rMCZ The Manacles
1a. Ecological description				
<p>The landward boundary of this site runs along the mean high water mark from Porthoustock Point around Manacle Point, as far as Polcres. The seaward boundary extends approximately 2.3km to sea, to encompass the Manacles rocky reef. The Manacles are a large underwater rocky reef system and a popular dive spot due to the high number of shipwrecks that surround them. The depth of the site is between 14 and 57 metres below sea level (chart datum). The high-quality reefs support a number of associated Features of Conservation Interest (FOCI) species, including one of the best examples of pink sea-fan <i>Eunicella verrucosa</i> communities and the pink sea-fan anemone <i>Amphianthus dohrnii</i> in the region, with dense populations particularly on the flat open sea bed below the Voices on the Manacles, and on Pencra Reef. The Ross coral <i>Pentapora fascialis</i>, crawfish <i>Palinurus elephas</i> and short-snouted seahorses have been recorded in the site. Local group feedback indicates that the FOCI habitats 'fragile sponge and anthozoan communities on subtidal rocky habitats' and 'intertidal underboulder communities' are present in this site, but there are no records of these features mapped.</p> <p>The west of the Manacles has deeply gullied outcropping bedrock, with gullies opening out into an area of large boulders. Gully sides are almost sheer and up to 5 metres high. The top of the gully sides contains sparse kelp and red foliose algae. The gully floor and sides are dominated by hydroids, including <i>Aglaophenia pluma</i> and <i>Halecium halecium</i> (abundant). Anthozoans are also strongly represented, with <i>Actinothoe sphyrodeta</i>, occasional colonies of <i>Alcyonium glomeratum</i>, <i>Caryophyllia</i>, <i>Corynactis</i> and <i>Metridium senile</i>.</p> <p>In the east, the sea bed consists of large boulders and rocky outcrops separated by areas of muddy shell gravel. The majority of the rock surface is covered by a hydroid/bryozoans turf in which <i>Polyzonias</i> and <i>Obelia dichotoma</i> are common. Other conspicuous species include pink sea-fan <i>Eunicella verrucosa</i>, <i>Alcyonium digitatum</i>, <i>Nemertesia antennina</i> and Ross coral <i>Pentapora foliacea</i>.</p> <p>There are productive tidal fronts in this area. The area is of importance for basking sharks, and is an important feeding area for small cetaceans, in particular harbour porpoise and (seasonally) minke whale (Lieberknecht and others, 2011).</p>				
1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km <sup>2</sup> )	No. of point records	Baseline	Impact of MCZ

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<i>Broad-scale Habitats</i>				
Intertidal coarse sediment	0.03	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.02	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	< 0.01	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy circalittoral rock	0.18	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy infralittoral rock	0.19	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.04	-	Favourable Condition	Maintained at Favourable Condition
Subtidal coarse sediment	0.95	-	Favourable Condition	Maintained at Favourable Condition
Subtidal macrophyte-dominated sediment	1.03	-	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for Subtidal macrophyte dominated sediment be changed from “Maintain” to “Recover to Favourable Condition”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
Subtidal mixed sediments	0.08	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	0.96	-	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
Maerl beds	1.01	-	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for Maerl beds be changed from “Maintain” to “Recover to Favourable Condition”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
<i>Species of Conservation Importance</i>				
<i>Amphianthus dohrnii</i>	-	3	Favourable Condition	Maintained at Favourable Condition
<i>Eunicella verrucosa</i>	-	58	Favourable Condition	Maintained at Favourable Condition
<i>Halicystus auricula</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Leptopsammia pruvoti</i>	-	2	Favourable Condition	Maintained at Favourable Condition
<i>Palinurus elephas</i>	-	2	Unfavourable Condition	Recover to 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
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Moderate energy intertidal rock, intertidal coarse sediment, moderate energy infralittoral rock, moderate energy circalittoral rock, subtidal coarse sediment, subtidal sand, subtidal mixed sediments, subtidal macrophyte dominated sediment, Sea-fan anemone, Pink sea-fan, Spiny lobster, Maerl beds, Stalked jellyfish				

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

<b>Table 2a. Archaeological heritage</b>		<b>rMCZ The Manacles</b>
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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.		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2</b>	
Five wrecks 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 The Manacles
<b>Source of costs of the rMCZ under Policy Option 1</b>		
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.		
<b>Management scenario 1:</b> No additional management.		
<b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls and dredges; no removal of crawfish <i>Palinurus elephas</i> from the rMCZ.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1	
<b>Overview:</b> The rMCZ is wholly within 6nm (nautical miles), and so is fished only by UK vessels. It extends to approximately 1nm from shore over the Manacles rocks. A number of commercial fishing restrictions are already in existence (see Annex E). There is potting throughout most of the rMCZ and the rMCZ also overlaps with part of a bass hand line fishery. Small parts of the rMCZ are worked by dredges and bottom trawls. Estimated total value of UK vessel landings from the rMCZ: £0.008m/yr.		

Table 2b. Commercial fisheries		rMCZ The Manacles	
<b>UK Dredges:</b> A small number (fewer than 5) of local scalloping vessels work to the east of the rMCZ (Cornwall Inland Fisheries and Conservation Authority [IFCA], pers. comm., 2011), including a narrow band of soft sediment approximately 300 metres wide in the eastern part of the rMCZ. Within the rMCZ access to suitable channels between the rocky outcrops is difficult and so visiting boats are not thought to fish there (Cornwall IFCA, pers. comm., 2011). Estimated value of UK dredge landings from the rMCZ: less than £0.001m/yr.	<b>Scenario 1:</b> No impacts are anticipated under Scenario 1.		
	<b>Scenario 2:</b> The rMCZ covers only a small amount of towable ground. While in some years valuable tows may be carried out in the rMCZ, overall the area covers a small proportion of the ground fished by scalloping vessels in the area and average annual landings are estimated to be low. No significant impacts are therefore anticipated under this scenario.		
	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
<b>UK Bottom trawls:</b> Otter trawls work to the south and east of the rMCZ, including a narrow band of soft sediment approximately 300 metres wide over the eastern part of the rMCZ. Within the rMCZ access to suitable channels between the rocky outcrops is difficult and so visiting boats are not thought to fish there (Cornwall IFCA, pers. comm., 2011). Estimated value of UK bottom trawl landings from the rMCZ: £0.002m/yr.	<b>Scenario 1:</b> No impacts are anticipated under Scenario 1.		
	<b>Scenario 2:</b> The rMCZ covers only a small amount of towable ground. While in some years valuable tows may be carried out in the rMCZ, overall the area covers a small proportion of the ground fished using otter trawls in the area and average annual landings are estimated to be low.		
	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	0.002



Table 2b. Commercial fisheries		rMCZ The Manacles													
<p><b>UK Pots and traps:</b> Potting occurs throughout the rMCZ and is carried out primarily by small under 10 metre vessels. Potters typically target crab and lobster. Crawfish is not a target species as the south coast is not thought to be natural crawfish habitat (Finding Sanctuary Vulnerability Assessment). Estimated value of landings from the rMCZ: £0.001m/yr.</p> <p>It has not been possible to estimate the value of landings attributed to crawfish; however, given the overall estimate and the fact that crawfish are not a target species it is assumed that the value of crawfish landings is &lt;£0.001m/yr.</p>	<p><b>Scenario 1:</b> No impacts are anticipated under Scenario 1.</p> <p><b>Scenario 2:</b> Crawfish are not a target species of potters active within the rMCZ and the value of crawfish landings is low. As such, no significant impacts are anticipated.</p> <p>Estimated annual value of UK 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>0.000</td><td>&lt;0.001</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	<0.001						
	£m/yr	Scenario 1	Scenario 2												
Value of landings affected	0.000	<0.001													
<p><b>UK Netting:</b> Netting occurs throughout the rMCZ and is carried out primarily by small under 10 metre vessels. Tangle netting in the rMCZ typically targets crustaceans and monkfish. Crawfish is not thought to be a target species as the south coast is not thought to be natural crawfish habitat (Finding Sanctuary Vulnerability Assessment). Estimated value of landings from the rMCZ: £0.003m/yr.</p> <p>It has not been possible to estimate the value of landings attributed to crawfish; however, given the overall estimate and the fact that crawfish are not a target species it is assumed that the value of crawfish landings is &lt;£0.001m/yr.</p>	<p><b>Scenario 1:</b> No impacts are anticipated under Scenario 1.</p> <p><b>Scenario 2:</b> Crawfish are not a target species of netters active within the rMCZ and the value of crawfish landings is low. As such, no significant impacts are anticipated.</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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>&lt;0.001</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	<0.001						
	£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		<p>Estimated annual value of UK vessel landings and gross value added (GVA) affected:</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>0.003</td><td>&lt;0.000</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.001</td><td>&lt;0.000</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.</p>		£m/yr	Scenario 1	Scenario 2	Best estimate	Value of landings affected	0.000	0.003	<0.000	GVA affected	0.000	0.001	<0.000
£m/yr	Scenario 1	Scenario 2	Best estimate												
Value of landings affected	0.000	0.003	<0.000												
GVA affected	0.000	0.001	<0.000												

Table 2b. Commercial fisheries		rMCZ The Manacles
	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 fishing</i>	None.	

Table 2c. Costs for Commercial fisheries under Policy Option 2		rMCZ The Manacles
<b>Source of costs of the rMCZ under Policy Option 2</b>		
<p>SNCBs advise that the reasoning for the advised change in the conservation objective for subtidal macrophyte dominated sediment is because the national fisheries QA showed levels of benthic trawling to be low in the area, but there is uncertainty regarding the overlap of this activity with the feature. Due to the sensitivity of this feature, and the possible overlap with trawl areas, a precautionary approach was taken and a recover objective advised.</p> <p>The appropriate management scenario for this is a closure to mobile demersal gears. However, since this scenario has already been taken into account prior to the change in conservation objective, this does not result in a change in costs for commercial fisheries in the area. Costs presented in Table 2b are still applicable.</p>		

Table 2d. National defence		rMCZ The Manacles
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
<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 and Policy Option 2	
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).	

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

<b>Table 3. Human activities in the site that are not negatively affected by the rMCZ under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ The Manacles</b>
Aquaculture, commercial fishing (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 scale<sup>15</sup></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>	<b>rMCZ The Manacles</b>
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<sup>15</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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 (All BSH)	Maintain			
A5.5 Subtidal macrophyte- dominated sediment	BSH	✓	✓	X	This site has not met the ENG target for viability (All BSH)	<i>Maintain</i>		Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.
A5.4 Subtidal mixed sediments	BSH	✓	✓	X	This site has not met the ENG target for viability (All BSH)	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A5.2 Subtidal sand	BSH	✓	✓	X	This site has not met the ENG target for viability (All BSH)	Maintain			
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	X	This site has not met the ENG target for viability (All BSH)	Maintain		This site is evidenced to support a high-quality reef system, which was the primary reason for selection.	
3.2 Moderate energy infralittoral rock	BSH	✓	✓	X	This site has not met the ENG target for viability (All BSH)	Maintain		This site is evidenced to support a high-quality reef system, which was the primary reason for selection.	
A2.1 Intertidal coarse sediment	BSH	✓	✓	X	This site has not met the ENG	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

					target viability BSH)	for (All			
A2.4 Intertidal mixed sediments	BSH	✓	✓	X	This site has not met the ENG target for viability (All BSH)	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	X	This site has not met the ENG target for viability (All BSH)	Maintain			
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	X	This site has not met the ENG target for viability (All BSH)	Maintain			
A1.2 Moderate energy intertidal rock	BSH	✓	✓	X	This site has not met the ENG target for viability (All	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

					BSH)				
Maerl beds	FOCI Habitat	X	x	✓	The replication target has not been met.	Maintain	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 (not including existing MPAs).	Rare / limited distribution at MCZ and UK level.	Rare / limited distribution at MCZ and UK level.
Sea-fan anemone <i>Amphianthus dohrnii</i>	FOCI Species	✓ * 1	✓	✓	None	Maintain	This site is critical for the achievement of replication guidelines	Local group feedback indicates that this is one of the best examples of pink sea fan communities and the pink sea fan anemone in the region.	This feature has a limited national distribution.
Pink sea-fan <i>Eunicella</i>	FOCI	✓	X	X	This site has not met the ENG	Maintain		Local group feedback	This feature has a limited

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<i>verrucosa</i>	Species				target viability for			indicates that this is one of the best examples of pink sea fan communities and the pink sea fan anemone in the region.	national distribution.
Stalked jellyfish <i>Haliclystus auricula</i>	FOCI Species	✓ * 1	✓	✓	None	Maintain	This feature is not protected in any existing MPAs within the SW region		
Sunset cup coral <i>Leptopsammia pruvoti</i>	FOCI Species	✓	✓	✓	None	Maintain			This feature has a limited national distribution.
Spiny lobster <i>Palinurus elephas</i>	FOCI Species	✓	X	X	This site has not met the ENG target for viability	Recover	This feature is not protected in any existing MPAs within the SW region, therefore, MCZ designation is needed to meet	There is evidence that <i>Palinurus elephas</i> is in unfavourable condition in all SW waters.	There is evidence that <i>Palinurus elephas</i> is in unfavourable condition in all SW waters. It has a limited



Annex I2. Site specific *Impact Assessment materials (Option 2)*

							the minimum ENG target for replication		distribution nationally.
Basking shark <i>Cetorhinus maximus</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain		Data submitted highlights the frequent use of this area by <i>Cetorhinus maximus</i> .	On the IUCN Red list the basking shark is considered globally vulnerable, and endangered in the north-east Atlantic.
Harbour porpoise <i>Phocoena phocoena</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain		Data submitted highlights the frequent use of this area by <i>Phocoena phocoena</i> as an important feeding area.	This species is a UK BAP priority species and is on the OSPAR List of threatened and/or declining species.
Site considerations									
Connectivity				✓					

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓ * <sup>2</sup>
Overlaps with existing MPAs	None

**Additional comments and site benefits:**

<sup>1</sup> Replication: This site is critical for the achievement of replication guidelines for *Amphianthus dohrnii* and *Haliclystus auricular*.

Local group feedback indicates that the FOCI habitats 'fragile sponge and anthozoan communities on subtidal rocky habitats' and 'intertidal underboulder communities' are present at this site, but the regional project did not have records of these features mapped (SAD in (Lieberknecht, et al. 2011)).

Non-ENG features: This area is of importance for basking sharks and an important feeding area for small cetaceans (in particular harbour porpoises) (SAD in (Lieberknecht, et al. 2011))

Local group feedback indicates that this is one of the best examples of pink sea fan communities and the pink sea fan anemone in the region ( SAD in (Lieberknecht, et al. 2011)).

Range of depths creates a heterogeneous seafloor topography within the site which encourages a higher variation of biodiversity/biotopes within the site.

This site has scientific value as it is easily accessible and has been previously well studied.

The primary reason for selecting this area as a rMCZ was the high-quality reefs present in the site, and the associated FOCI species (SAD in (Lieberknecht, et al. 2011)).

<sup>2</sup>Local stakeholder and scientific feedback indicates that there are productive tidal fronts in this area (SAD in (Lieberknecht, et al. 2011)).

*Palinurus elephas* is a commercially important species, taken both as a targeted species and as a by-catch from other fisheries. Intensive exploitation has contributed to a very substantial decline in population size since the 1970s. The protection of this species could have a significant contribution towards ecosystems services for fisheries, although it is likely that any protection measures would need to be at a wider scale than MCZ boundaries due to the mobile nature of this 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 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 The Manacles
Baseline	Beneficial impact under Policy Option 1	

Table 5a. Fish and shellfish for human consumption	rMCZ The Manacles	
<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 sediments help to support a number of fisheries (Fletcher and others, 2011). Subtidal macrophyte-dominated sediment habitats and maerl beds provide important nursery areas for commercial species (Fletcher and others, 2011; JNCC, 2011), and as such the rMCZ is likely to help to support potential on-site and off-site fisheries. 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 favourable condition, with the exception of crawfish which is 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, most of the features of the rMCZ will be maintained in favourable condition. Crawfish populations 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>Management of fishing activity within the rMCZ may reduce the on-site fishing mortality of species which may benefit commercial stocks, particularly crawfish which are the subject of targeted management. As landings of crawfish from the rMCZ may not be permitted, any benefits will be through local spill-over of individuals.</p> <p>With the exception of local crawfish populations, it is unclear whether the magnitude of reduced (on-site) fish harvesting will be enough to have any significant positive impact on commercial stocks of mobile species. No change in the condition of site habitats and their contribution to fish and shellfish provision is expected.</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>
	<p><b>Beneficial Impact under Policy Option 2</b></p>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advice that the conservation objective for both subtidal macrophyte-</p>	<p>Anticipated direction of change:</p>

Table 5a. Fish and shellfish for human consumption		rMCZ The Manacles
	<p>dominated sediment and Maerl beds be changed to “Recover to Favourable condition”. There are no additional management of fishing activities to allow these features to achieve their conservation objectives that are needed on top of what are set out in Table 2b.</p> <p>Subtidal macrophyte-dominated sediment habitats and maerl beds provide important nursery areas for commercial species (Fletcher and others, 2012), which means that if the conservation objective of these features are achieved, the improvement in the status of this feature may also improve the status of commercial species which depend on these habitats. However, the impacts will be different depending on which management measure is implemented; if the entire site is closed off to bottom trawls and dredges, then the benefits would be the spill-over effects of the improvement in the status of commercial species, and not the increase in landings of fishers within the area itself. Additionally, the site itself is relatively small, which means that any spill-over effects on fish stocks due to the improvement in the status of their nursery grounds will likely not be significant.</p>	<p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ The Manacles
Baseline	Beneficial impact	
<p><b>Angling:</b> 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 service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish which is in unfavourable condition.</p> <p>Local charter boats offer fishing trips to the Manacles throughout the year. Bass fishing is particularly popular at the Manacles. It has not been possible to</p>	<p>If the conservation objectives of the features are achieved the features will be maintained in favourable condition. Crawfish will be recovered to favourable condition. Additional management (above that in the baseline situation) of fishing activities is expected, which will prohibit the landing of crawfish from the rMCZ.</p> <p>No change in feature condition or general harvesting of fish and shellfish (with the exception of crawfish, which is not typically targeted by anglers) is anticipated and therefore no on-site or off-site benefits are expected.</p> <p>Designating the rMCZ will protect its features and the ecosystem services</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>


Table 5b. Recreation	rMCZ The Manacles	
estimate the value of angling in the site.	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).	
	<b>Beneficial Impact under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for both subtidal macrophyte-dominated sediment and Maerl beds be changed to “Recover to Favourable condition”. There are no additional management of recreational angling to allow these features to achieve their conservation objectives.</p> <p>Subtidal macrophyte-dominated sediment habitats and maerl beds provide important nursery areas for commercial species (Fletcher and others, 2012), which means that if the conservation objectives are achieved, an improvement in the status of this feature may also improve the status of commercial species which depend on these habitats. However, it is not clear if these habitats provide a nursery function for species that are captured by anglers. Seabass fishing is popular in the Manacles; therefore if there is a positive impact on seabass populations due to the protection of the habitats, then there will be a positive impact on recreational angling.</p> <p>There could be an increase in recreational angling in the area, however, this might be due to a change in preferences and does not necessarily represent an overall increase in angling in the country.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ The Manacles	
<p><b>Diving:</b> 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 service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish which is in unfavourable condition.</p> <p>The Manacles is a popular dive site, providing reefs, jewel anemones, crustaceans and wreck sites. Local companies provide beginner and advanced diving experiences.</p>	<p>If the conservation objectives of the features are achieved the features will be maintained in favourable condition (with the exception of crawfish which is not typically a focus for divers).</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 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: Moderate</p>
	Beneficial Impact under Policy Option 2	
	<p><b>Possible changes in beneficial impacts under Option 2 due to change in conservation objective</b></p> <p>SNCBs advise that the conservation objective for both subtidal macrophyte-dominated sediment and Maerl beds be changed to “Recover to Favourable condition”. There are no additional management of recreational diving to allow these features to achieve their conservation objectives.</p> <p>Subtidal macrophyte-dominated sediment habitats and maerl beds provide important nursery areas for several species (Fletcher and others, 2012), which means that if the conservation objectives are achieved, an</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ The Manacles
	improvement in the status of this feature may also improve the status and abundance of these species. This improvement in the status of the features and the abundance of species could improve diving experience experience. This could represent an overall increase in UK dive visits and/or a redistribution of location preferences	
<p><b>Wildlife watching:</b> 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 service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition, with the exception of crawfish which is in unfavourable condition.</p> <p>Harbour porpoises and dolphins can be spotted around the Manacles. Visitors can use local boat trips to view the wildlife. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<b>Beneficial Impact under Policy Option 1</b>	
	<p>If the conservation objectives of the features are achieved the features will be maintained in favourable condition (with the exception of crawfish which is not typically a focus for wildlife watching).</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>
	<b>Beneficial Impact under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for both subtidal macrophyte-dominated sediment and Maerl beds be changed to “Recover to Favourable</p>	<p>Anticipated direction of change:</p> <p>↑</p>



Table 5b. Recreation		rMCZ The Manacles
	<p>condition". There are no additional management of wildlife watching to allow these features to achieve their conservation objectives.</p> <p>Subtidal macrophyte-dominated sediment habitats and maerl beds provide important nursery areas for several fish species (Fletcher and others, 2012). Harbour porpoises and dolphins can be spotted around the area, and these species are likely to feed within the area as well. The achievement of the conservation objectives of protected features in this area may result in increase in the food source for these species, and is likely to increase their number or presence in the area. This could possibly improve the likelihood of spotting these species on a wildlife watching trip, which means that there could be an increase in the demand for this activity. However, 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 The Manacles
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> 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>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>

Table 5c. Research and education	rMCZ The Manacles	
<p><b>Education:</b> Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Current education provision is unknown. 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. 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 style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services	rMCZ The Manacles	
Baseline	Beneficial impact under Policy Option 1	
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> 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 and rock habitats can support particularly high biodiversity (Fletcher and others, 2012).</p> <p><b>Natural hazard protection:</b> The features of the site, in particular the intertidal</p>	<p>If the conservation objectives are achieved one of the features will be recovered to favourable condition. Others 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 style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ The Manacles
<p>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>	<b>Beneficial Impact under Policy Option 2</b>	
	<p><b>Possible changes in beneficial impacts under Option 2 due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective for both subtidal macrophyte-dominated sediment and Maerl beds be changed to “Recover to Favourable condition”.</p> <p>Both of these habitats contribute to the ecosystem services of regulation of pollution and environmental resilience; therefore it is possible that the recovery of these features due to the achievement of conservation objectives will improve the provision of these ecosystem services. However, the degree of this improvement relative to what is already expected under Policy Option 1 is not clear.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ The Manacles
<b>Baseline</b>	<b>Beneficial impact under Policy Option 1 and Policy Option 2</b>	

Table 5e. Non-use and option values	rMCZ The Manacles
<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>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 ('We surely must protect this breath-taking site') and to safeguard the local area from possible future impacts ('It's abundant with marine life and mammals and should stay that way!') and for future generations ('I have enjoyed diving over the years and would like my grandchildren to be able to enjoy the same'). The aesthetic value of the area was highlighted by a number of voters ('... it has a great view and it shouldn't be spoilt') as well as an emotional attachment built up from previous visits to the area ('I spent much of my childhood in this area and it is simply stunning').</p>
	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**rMCZ Torbay****Site area (km<sup>2</sup>): 19.9**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, the draft conservation objective for one feature in this site has been changed from what was established by the Regional Projects. This change and its impacts on management and costs are reflected under Policy Option 2.

Table 1. Conservation impacts	rMCZ Torbay
<b>1a. Ecological description</b>	
<p>The recommended Marine Conservation Zone (rMCZ) boundary mainly follows the boundary of the Torbay section of the Lyme Bay and Torbay candidate Special Area of Conservation (cSAC), extending from the coastline to depths of approximately 30 metres, and overlaps with Sites of Scientific Interest (SSSIs) in the area., the English Riviera Global Geopark and Berry Head National Nature Reserve. The rMCZ intersects with a mapped area of higher than average benthic species and habitat diversity. Local group feedback has highlighted the sea caves present in and around Torbay (though reefs and sea caves are protected by the SAC designation). There is an important wintering bird roost at Broadsands, and the second most important area for wintering diver and grebe concentrations in the South-West. The area, in particular around Berry Head, is important for sea birds. Species making up the assemblage include wintering divers and grebes (including black-throated diver <i>Gavia arctica</i>, great northern diver <i>Gavia immer</i>, great crested grebe <i>Podiceps cristatus</i> and breeding guillemot <i>Uria aalge</i>. The bay is an important breeding area and nursery for commercial fish species.</p>	
<p>The inshore areas of Torbay are described as predominantly soft muddy sands with communities characterised by the heart urchin <i>Echinocardium cordatum</i> and brittlestars <i>Amphiura</i> spp. and <i>Ophiura</i> spp., whereas cleaner sands close inshore hold dense populations of razor shells <i>Ensis</i> spp., heart urchins <i>Echinocardium cordatum</i> and seagrass <i>Zostera marina</i>. Two rare sublittoral habitats, peat bog and fossil forest, are found in the western end of Torbay. The peat bog is heavily bored by the common piddock. A layer of peat is also present intertidally, though submerged beneath the sandy beach.</p>	
<p>There are communities of polychaete worms and piddocks <i>Pholas dactylus</i>. Sublittoral limestone rock pinnacles, rich with sea squirts, sea anemones and sponges, are common. Where the sea bed becomes muddy, there are burrowing species including the angular crab <i>Goneplax rhomboides</i> and the red band fish <i>Cepola rubescens</i>. The substratum of offshore sea-bed fauna of Great West Bay is relatively uniform and the community present has been characterised as a 'boreal offshore muddy sand association'.</p>	
<p>The limestone has been eroded leading to the formation of caves, an uncommon marine habitat. Littoral caves pepper the headlands and islets of Torbay, and at Berry Head many extend into the sublittoral or are entirely sublittoral. In a cave near Rock Dove Cave (a limestone cliff south of Berry Head), <i>Caryophyllia inornata</i> was recorded as common together with the larger Devonshire cup coral <i>Caryophyllia smithii</i>, seven species of sponge, ten species of mollusc and 12 species of algae.</p>	
<p><i>Zostera</i> beds (at least 80ha) have been identified at seven sites around Torbay, most of them concentrated into two groups centred around the sheltered north-west and south-west corners of the bay. The beds at Elberry Cove and Torre Abbey Sands are the largest and rich faunas are associated with them, particularly of burrowing worms,</p>	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

anemones and echinoderms. There are several reports of seahorses within the seagrass beds.

Native oyster *Ostrea edulis*, peacock's tail *Padina pavonica* and honeycomb worm *Sabellaria alveolata* reefs have been identified in Torbay. The sheltered limestone and sandstone shores of Torbay are rich in animals, many of which are more typically found underwater but can be found here in profusion in damp, shaded locations. Sponges in particular are abundant, many of the rocky shores holding over a dozen species.

Bouldery areas are occasionally consolidated by the frequent reefs of the honeycomb worm *Sabellaria alveolata* and these areas have varied underboulder fauna. Hollicomber holds probably the densest population of the green sea urchin *Psammechinus miliaris* on the south-west coast of Britain as well as acting from time to time as a settlement area for the common starfish *Asterias rubens* (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>				
Intertidal coarse sediment	0.11	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.11	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mud	0.48	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.02	-	Favourable Condition	Maintained at Favourable Condition
Low energy intertidal rock	0.06	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.07	-	Favourable Condition	Maintained at Favourable Condition
Subtidal mud	8.83	-	Unfavourable Condition	Recover to Favourable Condition
<i>Habitats of Conservation Importance</i>				
Intertidal under boulder communities	-	6	Favourable Condition	Maintained at Favourable Condition
<i>Sabellaria alveolata</i> reefs	-	1	Favourable Condition	Maintained at Favourable Condition
Seagrass beds	0.90	3	Unfavourable Condition	Recover to Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Hippocampus guttulatus</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for the long snouted seahorse (<i>Hippocampus guttulatus</i>) is changed from “Maintained” to “Recover”. This is reflective of a “Recover” conservation objective for its habitat (seagrass beds). This means that Option 2 uses the conservation objective “Recover” for this feature.</b>				
<i>Ostrea edulis</i>	-	4	Favourable Condition	Maintained at Favourable Condition
<i>Padina pavonica</i>	-	4	Favourable Condition	Maintained at Favourable Condition
<i>Paludinella littorina</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<i>Non-ENG Mobile Species</i>				
<i>Gavia arctica</i>	-	-	Favourable Condition	Maintained at Favourable Condition

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<i>Gavia immer</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Podiceps cristatus</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Podiceps nigricollis</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Podiceps grisegena</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Podiceps auritus</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Uria aalge</i>	-	-	Favourable Condition	Maintained at Favourable Condition
<i>Phocoena phocoena</i>	-	-	Favourable Condition	Maintained at Favourable Condition

**Option 2:** This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.

Subtidal mud, Intertidal underboulder communities, seagrass beds, Long snouted seahorse

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

Table 2a. Archaeological heritage		rMCZ Torbay
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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 and Policy Option 2	
Six wrecks 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 under Policy Option 1	rMCZ Torbay
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Table 2b. Commercial fisheries under Policy Option 1		rMCZ Torbay
<b>Source of costs of the rMCZ</b>		
<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><b>Management scenario 1:</b> Zoned closure of sea grass beds in the rMCZ to dredges and bottom trawls.</p> <p><b>Management scenario 2:</b> Zoned closure of sea grass beds in the rMCZ to dredges, bottom trawls, pots and traps, nets, and hooks and lines.</p> <p><b>Management scenario 3:</b> Closure of entire rMCZ to bottom trawls and dredges.</p> <p><b>Management scenario 4:</b> Closure of entire rMCZ to dredges, bottom trawls, 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><b>Overview:</b> The rMCZ encompasses Brixham Harbour, one of the UK’s principal fishing ports, as well as Paignton and Torquay harbours. The rMCZ extends to approximately 1nm (nautical mile) from shore and is fished only by UK vessels. There is bottom trawling for sole, squid and cuttlefish, and mid-water trawling for sprat and anchovy in the bay, including in the rMCZ. Scalloping occurs seasonally (there are seasonal restrictions in place in the Devon and Severn Inland Fisheries and Conservation Authority (IFCA) district) and effort can be high, concentrated around the two headlands. Netters primarily targeting pollack and bass work throughout the bay, including within the rMCZ, while hand liners target mackerel around the headlands. There is some potting in the rMCZ, principally targeting brown crabs, although whelks, lobster, cuttlefish and spider crabs and also caught. Estimated total value of UK vessel landings from the rMCZ: £0.040m/yr</p> <p>The rMCZ is subject to a number of existing Devon and Severn IFCA fisheries restrictions (see Annex E), including a ‘gentlemen’s agreement’ for fishers using dredges and bottom trawls not to fish in areas of sea grass. The rMCZ also overlaps with part of the Lyme Bay and Torbay candidate Special Area of Conservation (SAC). Management of activities required for the cSAC may impose further restrictions on fishing activity in the area and therefore the area of the rMCZ. This may include limiting access to the cSAC for dredges and bottom trawls through the use of inshore vessel monitoring systems (VMS). This should allow vessels to continue to target much of the ground where they currently work (Devon and Severn IFCA, pers. comm., 2011).</p>		
<p><b>UK Dredges:</b> It is estimated that either 10 (South West Fishing Industry Group, 2011) or 11 (Devon and Severn IFCA, 2011) scallopers, all of less than 15 metres, fish in and around the rMCZ. Of these vessels, 8 are set up to use trawls as well as dredges.</p> <p>Scallop dredging occurs seasonally and effort can be intensive. Fishing effort is focused around two headlands, Hope’s Nose and Berry Head. The rMCZ, which extends approximately 1nm from shore, covers a proportion of the fishery around the two headlands (Hope’s Nose and Berry Head). Outputs from the MCZ Fisheries Model indicate that the area inside the rMCZ</p>	<p><b>Scenarios 1 and 2:</b> Fishing with dredges in areas of sea grass is thought to be minimal, due to the existing gentlemen’s agreement, although dredging is thought to still occasionally occur within these areas. No significant impacts of these scenarios are anticipated.</p> <p><b>Scenarios 3 and 4:</b> As the rMCZ does not cover the whole area of the scallop grounds off Torbay, the scenarios would only close part of the grounds. Effort displaced from inside the rMCZ is likely to be redistributed to the remainder of the Torbay ground or to other grounds in the South Devon inshore area. Scalloping grounds further offshore are less feasible for the vessels affected by these scenarios as they are all under 15 metres. Decisions by these vessels to fish further offshore may increase risks to safety.</p>	



Table 2b. Commercial fisheries under Policy Option 1		rMCZ Torbay													
<p>accounts for approximately 20% of the value of landings from the intensively fished areas around the headlands.</p> <p>Estimated value of UK dredge landings from the rMCZ: £0.011m/yr.</p> <p>In the South Devon inshore area, there are 5 known scallop beds (Curtis &amp; Anderson, 2008). The rMCZ overlaps with one of these. Access to another one of these five is currently limited as a result of the Lyme Bay Designated Area (Fishing Restrictions) Order 2008. Evidence indicates that fishers displaced by the Lyme Bay closed area have increased effort in the remaining scalloping grounds, including around Torbay (Mangi and others, 2011).</p>	<p>The additional restrictions in these scenarios may encourage more fishers to invest in larger vessels or to invest in switching to alternative gear types. Investment costs may be significant.</p> <p>The Lyme Bay closed area and expected management restrictions from the Lyme Bay and Torbay cSAC are already reducing the area of inshore scallop grounds available to vessels. The additional displacement of effort from the rMCZ to the remaining grounds may result in lower catch rates by scallopers in these grounds. It may also result in increased steaming costs, particularly for vessels from Brixham, for which the Torbay scallop ground is the closest to port. While evidence indicates that scalloping grounds have been able to absorb displaced effort from the Lyme Bay closed area, it is questioned whether this is likely to continue to be sustainable in the long term (Mangi and others, 2011). . Displacement of effort due to the closure of the rMCZ may add further pressure to these grounds, increasing uncertainty over their long-term sustainability.</p> <p>Displacement from the Lyme Bay closed area has resulted in increased gear conflict between static and mobile gear fishers. Displacement from the rMCZ in these scenarios is likely to increase this trend.</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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.011</td><td>0.011</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	0.011	0.011
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4										
	Value of landings affected	0.000	0.000	0.011	0.011										
	<p>As a result of restrictions under the SAC, the potential impact of the rMCZ may be less significant than described above.</p>														

Table 2b. Commercial fisheries under Policy Option 1		rMCZ Torbay													
<p><b>UK Bottom trawls:</b> Trawling activity occurs year-round in and around Torbay, with some effort occurring inside the rMCZ, particularly around the two headlands of Hope's Nose and Berry Head. Much of the effort is by otter trawls, which follow cuttlefish into the rMCZ in late summer (the cuttlefish fishery lasts about a month). Sole and squid are targeted year-round in the area and the bay provides a sheltered fishing ground during the winter. Beam trawling is less prevalent, with effort in the area focused to the south of Berry Head, largely outside the rMCZ.</p> <p>It is estimated that 11 trawlers (Devon and Severn IFCA, 2011), all of less than 15 metres, fish within the rMCZ (although not exclusively). Of these vessels, 6 are set up to switch between trawling and dredging.</p> <p>Estimated value of UK bottom trawl landings from the rMCZ: £0.011m/yr.</p> <p>Evidence indicates that bottom trawl fishers displaced by the Lyme Bay closed area, which is approximately 30km to the north-east of the rMCZ, have increased effort in grounds to the east of the area (Mangi and others, 2011), which is likely to include the area of the rMCZ.</p>	<p><b>Scenarios 1 and 2:</b> Fishing with trawls in areas of sea grass is thought to be minimal, due to the existing gentlemen's agreement, although trawling is thought to still occasionally occur within these areas. No significant impacts are anticipated..</p> <p><b>Scenarios 3 and 4:</b> These scenarios would directly affect the 11 vessels that fish in the area, displacing their effort to other grounds within the Torbay area that are beyond 1nm (the approximate distance of the rMCZ from shore), and to other fishing grounds.</p> <p>Based on the value of landings estimate, the level of displaced effort is not likely to be high enough to affect catch rates elsewhere in the area. However, the costs and catch rates of the 11 vessels that fish in the area may be affected. In particular, impacts may arise during the cuttlefish season and during the winter when the bay affords decent shelter for fishing in poor weather. The vessels are limited in their ability to fish offshore due to their size and decisions to fish further offshore may increase risks to safety.</p> <p>There is evidence of fishers affected by the Lyme Bay closed area and expected SAC management investing in larger vessels to allow them to access grounds that are further away (South West Fishing Industry Group, 2011; Southern IFCA, pers. comm., 2011; Mangi and others, 2011). The additional restrictions of the rMCZ may encourage more fishers to invest in larger vessels or to invest in switching to alternative gear types. Investment costs may be significant.</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><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>0.011</td><td>0.011</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	0.011	0.011
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4										
	Value of landings affected	0.000	0.000	0.011	0.011										
	<p>As a result of restrictions under the SAC, the potential impact of the rMCZ may be less significant than described above.</p>														

Table 2b. Commercial fisheries under Policy Option 1		rMCZ Torbay												
<b>UK Pots and traps:</b> There is some potting in the rMCZ, principally targeting brown crabs, as well as whelks, lobster, cuttlefish and spider crabs. Potting is not thought to occur in areas of sea grass. Estimated value of UK pot and trap landings from the rMCZ: £0.014m/yr.	<b>Scenarios 1, 2 and 3:</b> No impacts are anticipated under these scenarios.													
	<b>Scenario 4:</b> Under this scenario, the rMCZ would displace potting activity from the near-shore areas around Torbay.													
	Estimated annual value of UK pot and trap landings affected is expected to fall within the following range:													
	<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.000</td><td>0.014</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	0.000
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4										
Value of landings affected	0.000	0.000	0.000	0.014										
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.														
<b>UK Nets:</b> One netter is known to be active within the rMCZ, using set nets around Broadsands. Netting is not thought to occur in the areas of sea grass. Some drift netting (pelagic) occurs for herring and mackerel (Devon and Severn IFCA, pers. comm., 2011). Estimated value of UK net landings from the rMCZ: <£0.001m/yr.	<b>Scenarios 1, 2 and 3:</b> No impacts are anticipated under these scenarios.													
	<b>Scenario 4:</b> One vessel is likely to be affected by the rMCZ under this scenario. The estimated value of landings affected is low, and as such no significant impacts are anticipated.													
	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>0.000</td><td>&lt;0.001</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	0.000
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4										
Value of landings affected	0.000	0.000	0.000	<0.001										
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														

Table 2b. Commercial fisheries under Policy Option 1		rMCZ Torbay																						
		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.																						
<b>UK Hooks and lines:</b> The rMCZ is not a regular fishing ground for fishers using hooks and lines, although some occasional activity does occur. Estimated value of UK hook and line landings from the rMCZ: £0.001m/yr.		<b>Scenarios 1, 2 and 3:</b> No impacts are anticipated under these scenarios. <b>Scenario 4:</b> The rMCZ does not cover a regular fishing ground, and the estimated value of landings affected is low. As such no significant impacts are anticipated under this scenario. Estimated annual value of UK hook and line landings affected is expected to fall within the following range: <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td>Scenario 3</td><td>Scenario 4</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>0.000</td><td>0.001</td></tr></table>  In establishing the draft conservation objectives, the site features were assessed as having low vulnerability to fishing with hooks and lines at current levels. Where this is the case, this activity was not the primary reason for assigning ‘recover’ conservation objective(s). As such, it is anticipated that if management is required it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Value of landings affected	0.000	0.000	0.000	0.001								
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4																				
Value of landings affected	0.000	0.000	0.000	0.001																				
Total direct impact																								
<b>Total direct impact on UK commercial fishing</b>		Estimated annual value of UK vessel landings and gross value added (GVA) affected: <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>0.000</td><td>0.022</td><td>0.038</td><td>0.004</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.010</td><td>0.010</td><td>0.018</td><td>0.002</td></tr></table>					£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate	Value of landings affected	0.000	0.000	0.022	0.038	0.004	GVA affected	0.000	0.010	0.010	0.018	0.002
£m/yr	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Best estimate																			
Value of landings affected	0.000	0.000	0.022	0.038	0.004																			
GVA affected	0.000	0.010	0.010	0.018	0.002																			

Table 2b. Commercial fisheries under Policy Option 1		rMCZ Torbay
	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.	
<b>Impact on non-UK commercial fishing</b>	None.	

Table 2c. Costs for commercial fishing under Policy Option 2	rMCZ Torbay
<b>Source of costs of the rMCZ under Policy Option 2</b> The change in the conservation objective for the Long snouted seahorse <i>Hippocampus guttulatus</i> from “maintain” to “recover to favourable condition” does not require additional management measures for commercial fishing activities. This means that the costs presented in table 2b are still applicable under Option 2	

Table 2d. Flood and coastal erosion risk management (coastal defence)		rMCZ Torbay
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b> 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 and Policy Option 2	
Much of the coastline of the rMCZ is protected from erosion although natural cliff edges remain. The approach favoured in the Shoreline Management Plan (SMP) along the coastline of the rMCZ is to ‘hold the line’ on the protected frontages and allow natural erosion to occur elsewhere. The SMP highlights the value of the sandy beaches to the tourist offer of Torbay and indicates that these may need to be artificially nourished in the medium and longer	The rMCZ would be unlikely to result in any additional mitigation requirements beyond those required for the Lyme Bay and Torbay cSAC. No additional mitigation costs are therefore anticipated (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	

Table 2d. Flood and coastal erosion risk management (coastal defence)	rMCZ Torbay
<p>term (Environment Agency, pers. comm., 2012).</p> <p>Besides ongoing repair and maintenance routines for existing structures, in time more significant investment will be needed to maintain current standards of protection. Much of the investment will be to existing structures but there may be a need for new near-shore structures to reduce wave heights on vulnerable frontages. Schemes for near-shore structures are unlikely to be required within the Impact Assessment's 20-year timeframe. Some disturbance may be unavoidable to offshore reefs as a result of longer-term schemes for near-shore structures. Mitigation may need to be provided for impacts on features protected by the Lyme Bay and Torby cSAC. It is likely that this mitigation would be within the normal range of options typically required for large engineering projects of this nature (Environment Agency, pers. comm., 2012).</p>	<p>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 2e. Ports, harbours, shipping and disposal sites		rMCZ Torbay	
Source of costs of the rMCZ under Policy Option 1 and Policy Option 2			
<p><b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to planned harbour developments 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><b>Management scenario 2:</b> 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 port 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.</p>			
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2	
<u>Harbour Development:</u> As part of Brixham Harbour’s long-term regeneration strategy, a new outer harbour breakwater, known as the Northern Arm Breakwater, is planned. The planned breakwater will not overlap with the rMCZ, but is within 500 metres of it. The purpose of the breakwater is to	£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			

Table 2e. Ports, harbours, shipping and disposal sites	rMCZ Torbay
<p>provide calmer wave conditions in the harbour to protect existing commercial and leisure activities, to facilitate the development of leisure uses (specifically the development of marina facilities) and to provide an enclosed safe harbour in all weather conditions (Torbay Development Agency, 2012). A concept design report and site development brief were produced in 2011; however, funding is not currently available with which to take the development forward. Once funding can be put in place it is anticipated that the development will proceed (Torbay Development Agency, pers. comm., 2012). The harbours of Paignton and Torquay are also within 5km of the rMCZ.</p>	<p>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.</p> <p><b>Scenario 1:</b> As a result of the designation of the rMCZ, the licence applications for the Brixham Harbour Northern Arm Breakwater 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. The year in which the development is likely to come forward is currently unknown. For the purposes of the Impact Assessment (IA), it is assumed that a licence application will be submitted in the middle year of the IA period, 2022. These additional environmental assessment requirements are expected to result in an additional one-off cost of approximately £0.007m (see Annex N for calculations).</p> <p><b>Scenario 2:</b> for the Brixham harbour development, an additional one-off cost of £0.007m is expected in 2022 as a result of additional environmental impact assessment requirements (as detailed under Scenario 1). In addition, extra mitigation of potential impacts to MCZ features may be required. However, there is currently insufficient information on which to base any conclusions on the likelihood of additional mitigation being required and what that mitigation, if required, may entail (Natural England, pers. comm., 2012).</p> <p>For other 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)

<b>Table 3. Human activities in the site that are not negatively affected by the rMCZ under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ Torbay</b>
Aquaculture; commercial fishing (mid-water trawls, pots & traps, nets, hooks & lines); recreation (anchoring permitted subject to existing code of conduct; passage of boats around Berry Head subject to speed restrictions); 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 scale<sup>16</sup></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 Torbay
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

<sup>16</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs



Annex I2. Site specific *Impact Assessment materials (Option 2)*

A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain			
A1.3 Low energy intertidal rock	BSH	✓	✓	✓	None	Maintain	Out of all the rMCZs in the FS area, this site contributes the joint second largest area of low energy intertidal rock		
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓	None	Maintain			
A2.3 Intertidal mud	BSH	✓	✓	✓	None	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A2.4 Intertidal mixed sediments	BSH	✓	✓	✓	None	Maintain			
A5.3 Subtidal mud	BSH	✓	✓	X	Viability not met, site less than 5km minimum diameter	Recover			
Long-snouted seahorse <i>Hippocampus guttulatus</i>	FOCI Species	X	X	✓ * 1	Replication not met – less than three replicates in FS area.	Maintain	This feature falls short of the minimum number of replicates	This feature is not protected within existing MPAs within the FS area	WCA, OSPAR and BAP species
Intertidal underboulder communities	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓	None	Maintain			BAP and OSPAR species

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Peacock's tail <i>Padina pavonica</i>	FOCI Species	✓	✓	✓	None	Maintain	This FOCI is currently only reaching minimum replication target	This feature is not protected within existing MPAs within the FS area	BAP species
Sea snail <i>Paludinella littorina</i>	FOCI Species	✓	✓	✓	None	Maintain			OSPAR and WCA species
Honeycomb worm <i>Sabellaria alveolata</i> reefs	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Seagrass beds	FOCI Habitat	✓	✓	✓	None	Recover			BAP and OSPAR habitat
Black-throated loon <i>Gavia arctica</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			BAP species
Great northern loon <i>Gavia immer</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Great crested grebe <i>Podiceps cristatus</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			
Black-necked grebe <i>Podiceps nigricollis</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			WCA species
Red-necked grebe <i>Podiceps grisegena</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			
Slavonian grebe <i>Podiceps auritus</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			WCA species
Common guillemot <i>Uria aalge</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			OSPAR species
Harbour porpoise <i>Phocoena phocoena</i>	Non-ENG feature	N/A	N/A	N/A	N/A	Maintain			BAP, OSPAR and WCA species

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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:**

<sup>1</sup> Viability for *Hippocampus guttulatus* is dependent on patch diameter (0.5km). A 0.5km area encompassing the record(s) is possible within this rMCZ, however it is unclear whether the habitat available will support this feature. In Natural England's expert judgement, there are sufficient seagrass beds within the rMCZ boundary to support this species.

<sup>2</sup> There are two rare sublittoral habitats present within the site, peat bog and fossil forest, both of which are found in the western end of Torbay (SAD in (Lieberknecht, et al. 2011)). In addition the largest breeding colony of guillemots on the English Channel Coast is present on the cliffs at Berry Head (ref <http://www.countryside-trust.org.uk/bap/TCCT%20BAP%20pdfs/Seabirds%20SAP.pdf>)

## Annex I2. Site specific *Impact Assessment materials (Option 2)*

There are a significant amount of scientific records for this site, in particular for the seagrass beds, which have very rich faunas associated with them (SAD in (Lieberknecht, et al. 2011)). One of the seagrass beds within the rMCZ boundary is thought to be one of the largest in South-west England (pers comm, G Black).

This site has been described as a hotspot for both species of seahorse (*Hippocampus hippocampus* and *Hippocampus guttulatus*) (SAD in (Lieberknecht, Hooper, et al. 2011)).

Devon Wildlife Trust has described Torbay as the 'jewel in South Devon's crown' for marine wildlife (SAD in (Lieberknecht, et al. 2011)).

Torbay is the second most important area in the south-west for wintering diver and grebe concentrations (SAD in (Lieberknecht, et al. 2011)).

Important breeding and nursery area for commercial fish species (SAD in (Lieberknecht, et al. 2011)).

This is only one of two sites for *Hippocampus guttulatus* proposed within the FS area.

This site is one of only three proposed for *Padina pavonica* within the FS area.

This site is well known for its visiting marine megafauna (incl. Basking sharks, bottlenose dolphins, common dolphins, and porpoises).

### 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 Torbay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5a. Fish and shellfish for human consumption		rMCZ Torbay
<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 sediments help to support a number of fisheries (Fletcher and others, 2011). The bay is an important breeding and nursery area for commercial fish species; in particular, 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 in favourable and 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, some of the features 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>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>It is unclear whether the scale of habitat recovered and the magnitude of reduced (on-site) harvesting will be enough to have any significant positive impact on commercial stocks of mobile species. Low mobility and site-attached species populations, such as crab and crawfish, may improve as a result of improved habitat condition and reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ. Recovery of the seagrass beds may improve their nursery area function, benefiting populations of commercial species.</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 Torbay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5b. Recreation	rMCZ Torbay	
<p><b>Angling:</b> 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 that provided by features of the site when in favourable and unfavourable condition (see Table 1b).</p> <p>Torbay is a popular area for fishing. Shore-based fishing occurs all along the coastline. There is a particular concentration of shore-based and boat angling around the headlands of Hope's Nose and Berry Head. Species targeted include wrasse, bass, mackerel, garfish, bream, dab, dogfish, conger, codling and mullet. 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, some of the features will be recovered to favourable condition. Others will be maintained in favourable 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>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>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>
<p><b>Diving:</b> 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>Several diving clubs are active across Torbay, offering beginner and advanced diving lessons. There are many wreck sites off Torbay for divers to experience. It has not been possible to estimate the value of diving in the rMCZ.</p>	<b>Beneficial Impact under Policy Option 1</b>	
	<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 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>
	<b>Beneficial Impact under Policy Option 2</b>	



Table 5b. Recreation	rMCZ Torbay	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for the Long snouted seahorse <i>Hippocampus guttulatus</i> be changed from “maintain” to “recover to favourable condition. This is to reflect the “recover” conservation objective of its seagrass bed habitat. This change in conservation objective for the Long snouted seahorse does not result in additional management measures for diving.</p> <p>The change in CO aims to improve the status of the species in the area, and the achievement of the CO could allow the abundance, thus the visibility of the Long snouted seahorse, to increase. This could in turn improve the diving experience and therefore increase the value of the ecosystem service. However, it is not clear if this improvement in the ecosystem service will be additional to the improvements already expected prior to the change in the conservation objective of the Long snouted seahorse.</p>	<p>Anticipated direction of change:</p> <p>Unclear (relative to what is already expected prior to change in conservation objective)</p> <p>Confidence: Low</p>
<p><b>Wildlife watching:</b> 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>Marine life is abundant in Torbay and porpoises, dolphins and occasionally basking sharks are spotted. There are various companies offering boat trips to visitors. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<b>Beneficial Impact under Policy Option 1</b>	
	<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 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>
	<b>Beneficial Impact under Policy Option 2</b>	

Table 5b. Recreation		rMCZ Torbay
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for the Long snouted seahorse <i>Hippocampus guttulatus</i> be changed from “maintain” to “recover to favourable condition. This is to reflect the “recover” conservation objective of its seagrass bed habitat. This change in conservation objective for the Long snouted seahorse does not result in additional management measures for wildlife watching.</p> <p>Unlike divers, visitors that come for wildlife watching do not come into contact with the Long snouted seahorse since this species are not visible at the surface of the sea. However, the achievement of conservation objectives and the protection of this species and its habitat can also benefit other species. This means that there could be an improvement in the quality of wildlife watching in the site and the value of the ecosystem service. However, it is not clear if this will be additional to the improvements already expected prior to the change in conservation objective.</p>	<p>Anticipated direction of change:</p> <p>Unclear (relative to what is already expected prior to change in conservation objective)</p> <p>Confidence: Low</p>

Table 5c. Research and education		rMCZ Torbay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> 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>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>

Table 5c. Research and education		rMCZ Torbay
<p><b>Education:</b> 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 range of education-related activities are available in the Torbay area, which is a popular destination for visitors and schools. The UNESCO-recognised Geopark promotes education about and understanding of the geology around Torbay. The Torbay Coast and Countryside Trust undertakes a range of events and interpretation for schools, groups and the public as well as providing volunteer and training opportunities. The Berry Head Visitor Centre and the Seashore Centre are two centres for education interpretation and events. 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. 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 Torbay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5d. Regulating services		rMCZ Torbay
<p><b>Regulation of pollution:</b> 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. Native oyster beds sequester carbon and filter algae and sediment from the water (Fletcher and others, 2012).</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2012).</p> <p><b>Natural hazard protection:</b> 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 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 style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ Torbay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5e. Non-use and option values		rMCZ Torbay
<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>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 and wide range of plants and animals in the bay ('This is a stunning area of natural underwater beauty, protecting it will benefit all the species that live there as well as the surrounding areas') followed by a sense that the whole site is amazing, and that it is of personal importance to stakeholders. Many voters demonstrated an emotional attachment to the area ('My birthplace, and where I grew up'; 'Many happy memories of playing by the sea here'; 'My favourite place in the world!').</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**rMCZ Upper Fowey and Pont Pill****Site area (km<sup>2</sup>): 2.0**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, the draft conservation objective for one feature in this site has been changed from what was established by the Regional Projects. This change and its impacts on management and costs are reflected under Policy Option 2.

Table 1. Conservation impacts				rMCZ Upper Fowey and Pont Pill	
1a. Ecological description					
<p>This recommended Marine Conservation Zone is made up of two parts. The larger part consists of the upper Fowey Estuary, with the site boundary following the coastline along the mean high water mark, from the tidal limit at Lostwithiel to Bodmin Pill, a small tributary to the estuary south of Golant. The second part consists of Pont Pill, a tributary estuary flowing into the Fowey on the eastern side. The site encompasses the Fowey Estuary Voluntary Marine Conservation Area.</p> <p>The Fowey Estuary is a ria, with areas of intertidal mud and saltmarsh in the upper reaches. Previously, large quantities of sediment were introduced into the upper ria by ore mining activity. Today, in common with other rias, the Fowey receives a low riverine sediment input. Blue mussel <i>Mytilus edulis</i> and European eel <i>Anguilla anguilla</i> have been reported in the estuary. The estuary also serves an 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	
<i>Broad-scale Habitats</i>					
Coastal saltmarsh and saline reedbeds	0.01	-	Favourable Condition	Maintained at Favourable Condition	
Intertidal coarse sediment	< 0.01	-	Favourable Condition	Maintained at Favourable Condition	
Intertidal mud	1.51	-	Favourable Condition	Maintained at Favourable Condition	
Intertidal sand and muddy sand	< 0.01	-	Favourable Condition	Maintained at Favourable Condition	
Low energy intertidal rock	0.02	-	Favourable Condition	Maintained at Favourable Condition	
<i>Habitats of Conservation Importance</i>					

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Estuarine rocky habitats	-	13	Favourable Condition	Maintained at Favourable Condition
Sheltered muddy gravels	0.01	-	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
Anguilla anguilla			To be confirmed	To be confirmed
<b>SNCBs advice that the conservation objective for the European eel (<i>Anguilla anguilla</i>) is “Recover”; therefore Option 2 uses the conservation objective “Recover” for this feature..</b>				
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Low energy intertidal rock, Intertidal sand and muddy sand, intertidal mud, Estuarine rocky habitats, European eel				

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

<b>Table 2a. Flood and coastal erosion risk management (coastal defence)</b>		<b>rMCZ Upper Fowey and Pont Pill</b>
<b>Source of costs of the recommended Marine Conservation Zone (MCZ) under Policy Option 1 and Policy Option 2</b>		
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).		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2</b>	
The 0 to 20 year Shoreline Management Plan policies along the edges of the rMCZ are for ‘hold the line’ at Polruan and Fowey and for ‘no active intervention’ elsewhere. 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 Upper Fowey and Pont Pill	
Source of costs of the recommended Marine Conservation Zone (MCZ) under Policy Option 1 and Policy Option 2			
<b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to disposal sites 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.			
<b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to disposal sites and future potential port developments. 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 and Policy Option 2	
<u>Disposal Sites:</u> Lantic Bay disposal site is situated off Fowey (more than 1km from the rMCZ and less than 5km). For the purposes of the Impact Assessment (IA), it is assumed that an average of 0.9 applications (equivalent to the average number/yr between 2001 and 2010) (Cefas, 2011) for licences to dispose of material at the disposal site will be made in each year over the timeframe of the IA.	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.000	0.006*
<u>Harbour development:</u> The harbours of Fowey and Polruan are within 5km of the rMCZ. There are no known plans for development at either 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.		
	<b>Scenario 1:</b> No costs are anticipated under Scenario 1.		
	<b>Scenario 2:</b>		
	<u>Disposal sites:</u> Future licence applications for disposing of material at the Lantic Bay disposal site 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 £0.006m/yr (see Annex N for calculations).		
	<u>Harbour development:</u> For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at 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 2c. Commercial fishing		rMCZ Upper Fowey and Pont Pill
<b>Source of costs for the rMCZ under Policy Option 2</b>		
<b>Policy Option 1</b>		
No management anticipated, based on the Regional Project draft Conservation Objectives (and therefore no costs are anticipated).		
<b>Policy Option 2</b>		
<p>Natural England and JNCC fisheries specialists provided advice on the levels of sensitivity of all broadscale habitats to fishing activities (JNCC and Natural England MCZ fisheries advice). This advice was peer reviewed (by CEFAS) and was used to inform the management scenarios which were applied by the Regional Projects to the MCZs for the purposes of Impact Assessment (Annex J3 in the Impact Assessment) FOCI were not assessed in this advice, with the result that Natural England has not produced a peer-reviewed advice document on the sensitivity of FOCI, including eel. In the absence of such an advice document regarding sensitivity, Natural England feel it would be premature to identify the likely management scenarios for eel, as this would not be clearly linked to a peer-reviewed evidence base, at this stage.</p> <p>However, given that there are a number of reasons for the decline of eel populations, and the lack of information in at least some areas describing the specific impacts to eel, it is likely that should any management scenarios be identified they would reflect this uncertainty. As such, they would be similar to the other management scenarios recommended for features which have a recover objective and are potentially sensitive to fishing, resulting in two recommended management scenarios of a high cost and a low cost. This suggestion is not Natural England's formal advice, as there may be differences between the impacts of gear types, which Natural England have not yet had the opportunity to fully consider, but which could be used as an interim measure.</p>		
<b>Source of costs of the rMCZ</b>		
<b>Management scenario 1:</b> No additional management		
<b>Management scenario 2:</b> Closure of the rMCZ to bottom trawling		
<b>Summary of all fisheries:</b> Estimated annual value of landings from the rMCZ: £0.001 m/yr (MCZ Fisheries Model).		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 2	

Table 2c. Commercial fishing		rMCZ Upper Fowey and Pont Pill													
<b>Overview:</b> There is currently no known commercial fishing within the rMCZ and therefore no value derived from on-site fisheries.															
<b>UK Bottom trawling</b>	<b>Management scenario 1:</b> No impacts														
	<b>Management scenario 2:</b> Existing bottom trawling activities will no longer be allowed in this site, which means that annual value of bottom trawling will be affected.  Estimated annual value of UK bottom trawling landings affected is expected to fall within the following range:														
	<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.001</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.001						
	£m/yr	Scenario 1	Scenario 2												
Value of landings affected	0.000	0.001													
As a result of restrictions under the SAC, the potential impact of the rMCZ may be less significant than described above.															
Total direct impact under Policy Option 2															
<b>Total direct impact on UK commercial fishing</b>	Estimated annual value of UK vessel landings and gross value added (GVA) affected:														
	<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>0.001</td><td>&lt;0.001</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.000</td><td>0.000</td></tr></table>			£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
	£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.															

Table 2c. Commercial fishing	rMCZ Upper Fowey and Pont Pill
	This is based upon an assumption of average displacement across all rMCZs, and may be an under- or over-estimate for this 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 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ: Upper Fowey and Pont Pill
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 <sup>17</sup>	rMCZ: Upper Fowey and Pont Pill
✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows	

<sup>17</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

indicate where SNCBs do not agree with a feature being proposed for designation. Recommended conservation objectives in <i>italics</i> 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
A2.5 Coastal salt marshes and saline reedbeds	BSH	✓	✓	✓	None	Maintain		Important for connectivity relating to salt marsh along the south coast of the SW peninsula	
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			
A1.3 Low energy intertidal	BSH	✓	✓	✓	None	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

rock									
Estuarine rocky habitats	FOCI Habitat	✓	✓	✓	None	Maintain			
Sheltered muddy gravels	FOCI Habitat	✓	✓	✓	None	Maintain			
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 reaching 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				✓ * 2					
Overlaps with existing MPAs				None					

**Additional comments and site benefits:**

<sup>1</sup> Important for connectivity of salt marsh along the south coast of the SW peninsula.

<sup>2</sup> The site includes a range of estuarine habitats typical of a south-western ria and has additional ecological importance in terms of high productivity and function as a nursery area.

This site is important for maintaining connectivity of coastal salt marsh along the SW peninsula.

**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 can be found in Annex H.

Table 5a. Fish and shellfish for human consumption		rMCZ Upper Fowey and Pont Pill
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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>↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Upper Fowey and Pont Pill	
Baseline	Beneficial impact under Policy Option 1		
<p><b>Angling:</b> 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>Fowey is a popular place to fish with popular rock locations. Local companies provide charter boats for angling. It is a good location for salmon and sea trout fishing. 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>
	Beneficial Impact under Policy Option 2		
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective of the European eel <i>Anguilla Anguilla</i> is set to “favourable” which means that if the conservation objectives for all features are achieved, then they will all be at favourable condition. No additional management (above that in the baseline situation) of angling activities is expected.</p> <p>An improvement in the condition of European eel may have benefits for fishers. Eels are a popular angling species (Fletcher and others, 2012) and if the rMCZ results in an increase in the size of individual caught by anglers then this is expected to improve the quality of angling in the site (or off site) and therefore the value of the ecosystem service.</p>		<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>


Table 5b. Recreation		rMCZ Upper Fowey and Pont Pill	
<b>Diving:</b> Diving is not known to take place in the rMCZ.	Beneficial Impact under Policy Option 1 and Policy Option 2		
	N/A		N/A
<b>Wildlife watching:</b> Fletcher and others (2012) identify that some of the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition.  There are several walks in the area for wildlife watchers, and boat trips are provided for visitors wishing to experience the marine wildlife. Egrets, kingfishers, cormorants and shoals of grey mullet are often spotted along the River Fowey. It has not been possible to estimate the value of wildlife watching in the rMCZ.	Beneficial Impact under Policy Option 1 and Policy Option 2		
	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.  No change in on-site feature condition is anticipated and therefore no benefits to wildlife watching are expected.  Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).  The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent a redistribution of location preferences, rather than an overall increase in UK wildlife watching visits.		Anticipated direction of change:    Confidence: Moderate

Table 5c. Research and education		rMCZ Upper Fowey and Pont Pill
Baseline	Beneficial impact under Policy Option 1 and 2	



Table 5c. Research and education		rMCZ Upper Fowey and Pont Pill
<p><b>Research:</b> 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>Surveys on parts of the estuary have been carried out by the National Trust and the Environment Agency and the estuary management plan expresses a desire for further survey work and research to be undertaken (Smith &amp; Porter, 2003). 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><b>Education:</b> 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 for schools and the public are provided by Cornwall Wildlife Trust and Friends of the Fowey, often linked to the Fowey Voluntary Marine Conservation Area. Events include guided walks, a snorkel safari and talks. The estuary management plan recognises the benefits of undertaking public education and interpretation around the estuary (Smith &amp; Porter, 2003). 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 Upper Fowey and Pont Pill
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5d. Regulating services		rMCZ Upper Fowey and Pont Pill
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> 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 biodiversity (Fletcher and others, 2012).</p> <p><b>Natural hazard protection:</b> 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 Upper Fowey and Pont Pill
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5e. Non-use and option values	rMCZ Upper Fowey and Pont Pill	
<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>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. The most common reasons were for the spectacular scenery, because they felt the area was unspoilt, and because of a personal affiliation with the site.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**rMCZ Whitsand and Looe Bay****Site area (km<sup>2</sup>): 51.5**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

- Based on SNCB advice, draft conservation objectives for some features have been changed from those established by the Regional Projects. These changes and their impacts on management and costs are reflected under Policy Option 2.

Table 1. Conservation impacts			rMCZ Whitsand and Looe Bay	
1a. Ecological description				
<p>The site boundary follows the coastline along the mean high water mark, extending seawards to depths of up to 25 metres. Whitsand Bay is a 6km stretch of sand and shingle with gullies carved by strong tides and cross currents. Mapped data show the whole subtidal area of the site as sediment – East Whitsand Bay is composed of clean sand also dominated by polychaetes with <i>Magelona mirabilis</i> occurring in abundance. Further west, the sediment is muddier and characterised by a heart urchin <i>Echinocardium cordatum</i> and brittlestar <i>Amphiura filiformis</i> community. There are rocky ledges present in the bay, with associated hard substrate species (e.g. pink sea-fan <i>Eunicella verrucosa</i>).</p> <p>The site intersects with an area of higher than average benthic species diversity and is a good breeding area and nursery for commercial fish species, as well as an important site for sea birds. Blue mussel beds, intertidal underboulder communities, tide-swept biotopes, the fan mussel <i>Atrina pectinata</i> and the sunset cup coral <i>Leptopsammia pruvoti</i> are found in this site.</p> <p>An extensive series of gullies, overhangs, reefs and rock pools are present on the lower shore. Extensive shallow lagoons, partially sand-filled, support a great variety of plants and animals, including patches of seagrass <i>Zostera marina</i>. <i>Jania rubens</i>, a southern species of red corraline alga, has been recorded as being unusually abundant within these pools. Ocean quahog <i>Arctica islandica</i>, pink sea-fan <i>Eunicella verrucosa</i>, pink sea-fan anemone <i>Amphianthus dohrnii</i>, giant goby <i>Gobius cobitis</i> and seahorses (mainly in the Looe area) have also been recorded in the site.</p> <p>Off Rame Head the sediment is mainly fine sand and mud and infaunal communities are numerically dominated by polychaetes, with sea cucumbers <i>Leptosynapta inhaerens</i> and <i>Trachythyone elongata</i> and the burrowing prawn <i>Callianassa subterranea</i> 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
<i>Broad-scale Habitats</i>				
Moderate energy circalittoral rock	-	-	Favourable Condition	Maintained at Favourable Condition
High energy infralittoral rock	1.26	-	Favourable Condition	Maintained at Favourable Condition
High energy intertidal rock	0.03	-	Favourable Condition	Maintained at Favourable Condition
Intertidal coarse sediment	0.47	-	Favourable Condition	Maintained at Favourable Condition
Intertidal mixed sediments	0.45	-	Favourable Condition	Maintained at Favourable Condition
Intertidal sand and muddy sand	0.18	-	Favourable Condition	Maintained at Favourable Condition
Low energy intertidal rock	0.06	-	Favourable Condition	Maintained at Favourable Condition
Moderate energy intertidal rock	0.07	-	Favourable Condition	Maintained at Favourable Condition

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Subtidal coarse sediment	25.61	-	Favourable Condition	Maintained at Favourable Condition
Subtidal sand	22.35	-	Favourable Condition	Maintained at Favourable Condition
<i>Habitats of Conservation Importance</i>				
Seagrass beds	0.02	-	Favourable Condition	Maintained at Favourable Condition
<i>Species of Conservation Importance</i>				
<i>Amphianthus dohrnii</i>	-	4	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for the Sea fan anemone (<i>Amphianthus dohrnii</i>) is changed from “Maintain” to “Recover to Favourable Condition” ; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
<i>Arctica islandica</i>	-	3	Favourable Condition	Maintained at Favourable Condition
<i>Eunicella verrucosa</i>	-	26	Favourable Condition	Maintained at Favourable Condition
<b>SNCBs advise that the conservation objective for the Pink sea fan (<i>Eunicella verrucosa</i>) is changed from “Maintain” to “Recover”; therefore Option 2 uses the conservation objective “Recover” for this feature.</b>				
<i>Gobius cobitis</i>	-	3	Favourable Condition	Maintained at Favourable Condition
<i>Haliclystus auricula</i>	-	2	Favourable Condition	Maintained at Favourable Condition
<i>Hippocampus guttulatus</i>	-	1	Favourable Condition	Maintained at Favourable Condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. High energy intertidal rock, Sea-fan anemone, Pink sea-fan				

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

Table 2a. Archaeological heritage		rMCZ Whitsand and Looe Bay
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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 and Policy Option 2	
Several World War II defences can be found in the site (Lee, 2010). 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	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 Whitsand and Looe Bay
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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 and Policy Option 2	
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). No further impacts on activities related to archaeology are anticipated.	

Table 2b. Commercial fisheries		rMCZ Whitsand and Looe Bay
<b>Source of costs of the rMCZ under Policy Option 1</b> 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.		
<b>Management scenario 1:</b> No additional management.		
<b>Management scenario 2:</b> Closure of areas of sea-fan anenone <i>Amphianthus dohrnii</i> , ocean quahog <i>Arctica islandica</i> , pink sea-fan <i>Eunicella verrucosa</i> , giant goby <i>Gobius cobitis</i> , kaleidoscope jellyfish <i>Haliclystus auricula</i> and long-snouted seahorse <i>Hippocampus guttulatus</i> in the rMCZ to bottom trawls and dredges.		
<b>Management scenario 3:</b> 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
<b>Overview:</b> The rMCZ is wholly inside 6nm (nautical miles) (so is fished only by UK vessels) and a number of commercial fishing restrictions are already in existence (listed in Annex E). Nets are the most common gear used in the rMCZ, targeting red mullet during the summer and bass year-round. Ring netters target Cornish sardine during the summer and anchovy during the winter (Cornwall Inland Fisheries and Conservation Authority [IFCA], pers. comm., 2010). Sporadic hand lining and use of trolled lines primarily target mackerel (Cornwall IFCA, pers. comm., 2010). Potting activity is focused on lobster, spider crabs and brown crabs. There is a low level of mobile gear fishing in the rMCZ typically by vessels from Looe, although the number of trawlers working out of the port has been in decline (Cornwall IFCA, pers. comm., 2010). There is a commercial fishing fleet of 38 vessels (Cornwall SFC, 2010) operating out of Looe Harbour at the western end of the bay. Estimated total value of UK vessel landings		

Table 2b. Commercial fisheries		rMCZ Whitsand and Looe Bay			
from the rMCZ: £0.076m/yr.					
<b>UK Dredges:</b> Dredging is not common in the rMCZ, although there is some occasional activity by under 15 metre vessels (MCZ Fisheries Model). Estimated value of UK dredge landings from the rMCZ: £0.009m/yr.		<b>Scenario 1:</b> No impacts are anticipated under Scenario 1. <b>Scenario 2 and 3:</b> The rMCZ is not a regular scalloping ground and there are therefore not expected to be any significant impacts on UK vessels as a result of the rMCZ under these scenarios. However, it should be noted that the closure would remove a potential fishing ground option from the fleet.  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	0.003	0.009

Table 2b. Commercial fisheries		rMCZ Whitsand and Looe Bay			
<b>UK Bottom trawls:</b> Fewer than 5 vessels from Looe (Cornwall IFCA, pers. comm., 2011), all less than 15 metres in length, work in the rMCZ regularly, although not exclusively, targeting a variety of flat fish (South West Fishing Industry Group, 2011; Cornwall IFCA, pers. comm., 2011). The bay is also occasionally used by other vessels for sheltered fishing in poor weather, although this is not thought to contribute much to landings values (South West Fishing Industry Group, 2011). Estimated value of UK bottom trawl landings from the rMCZ: £0.035m/yr.	<b>Scenario 1:</b> No impacts are anticipated under Scenario 1.				
	<b>Scenarios 2 and 3:</b> Vessels that regularly fish in the site may respond to the scenarios by increasing their fishing effort further offshore, outside the rMCZ boundary. This will pose a risk to the safety of those vessels because the vessels are all small and are not suitable for working further offshore except in good weather (South West Fishing Industry Group, 2011). If the affected fishers feel unable to increase their fishing effort outside the rMCZ then this may affect the viability of their businesses.				
	As the bay is occasionally used by visiting trawlers during poor weather, closure of the rMCZ may result in a safety risk by causing these vessels to fish further offshore and could affect their ability to successfully fish on poor weather days (South West Fishing Industry Group, 2011).				
	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	0.012	0.035	
Total direct impact under Policy Option 1					
<b>Total direct impact on UK commercial fishing</b>	Estimated annual value of UK vessel landings and gross value added (GVA) affected is expected to fall within the following range:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate
	Value of landings affected	0.000	0.015	0.044	0.005
	GVA affected	0.000	0.007	0.002	0.002



Table 2b. Commercial fisheries		rMCZ Whitsand and Looe Bay
		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.
<b>Impact on non-UK commercial fishing</b>		None.

Table 2c. Costs for commercial fishing under Option 2	rMCZ Whitsand and Looe Bay
<b>Source of costs of the rMCZ under Policy Option 2</b>	
The change in conservation objective for the Sea fan anemone and the Pink sea fan do not result in additional costs since management of bottom trawls and dredges are already included in the management scenarios in Table 2b. This means that the costs presented in Table 2b apply for both Policy Option 1 and Policy Option 2.	

Table 2d. Flood and coastal erosion risk management (coastal defence)		rMCZ Whitsand and Looe Bay
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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 and Policy Option 2	
The 0 to 20 year Shoreline Management Plan policies along the shoreline of the rMCZ are 'hold the line' at Seaton, Looe and Plaidy, and 'no active intervention' elsewhere. 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 2d. Flood and coastal erosion risk management (coastal defence)		rMCZ Whitsand and Looe Bay
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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 and Policy Option 2	
	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 2e. National defence		rMCZ Whitsand and Looe Bay
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
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 and Policy Option 2	
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 2f. Ports, harbours, shipping and disposal sites	rMCZ Whitsand and Looe Bay
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**Source of costs of the rMCZ under Policy Option 1 and Policy Option 2**

**Management scenario 1:** Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to disposal of dredge material only. 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 disposal of dredge material and future potential port developments. 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 and Policy Option 2		
<p><u>Disposal sites:</u> Rame Head South dredge disposal ground is located less than 1km to the south of the rMCZ. This is an active disposal site for dredged material from both maintenance and capital works. The site received an average of 111,700 tonnes of material from maintenance dredging works per annum, and 76,800 wet tonnes of material from capital dredging works, over the period 1999 to 2008 (Cefas, 2011). For the purposes of the Impact Assessment (IA), it is assumed that an average of 1.7 applications (equivalent to the average number/yr between 2001 and 2010) (Cefas, 2011) for licences to dispose of material at the Rame Head South dredge disposal ground will be made in each year over the timeframe of the IA. The Fort Picklecombe Y disposal ground is located to the east of the rMCZ near Cawsand Bay. For the purposes of the IA, it is assumed that an average of 0.2 applications (equivalent to the average number/yr between 2001 and 2010) (Cefas, 2011) for licences to dispose of material at the Fort Picklecombe Y disposal ground will be made in each year over the timeframe of the IA.</p> <p><u>Harbour development:</u> The harbours of Looe and Portwrinkle are adjacent to the rMCZ and Polperro Harbour is within 5km. There are no known plans for development at either harbour.</p>	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.011	0.013*
	<p>** 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.</p> <p><b>Scenario 1:</b> Future licence applications for disposal of material at the Rame Head South 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. This is expected to result in additional costs averaging £0.011m/yr over the timeframe of the IA (see Annex N for details).</p> <p><b>Scenario 2:</b></p> <p><u>Disposal sites:</u> Future licence applications for disposal of material at the Rame Head South and Fort Picklecombe Y disposal grounds will need to consider the potential effects of disposal activity on the features protected by the rMCZ, and the rMCZ conservation objectives. This is expected to result in additional costs averaging £0.013m/yr over the timeframe of the IA (see Annex N for details).</p> <p><u>Harbour development:</u> For future port and harbour developments within 5km of the rMCZ that are not yet known of, future licence applications will need to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (these costs are not assessed at the site level, but are presented at the</p>		

Table 2f. Ports, harbours, shipping and disposal sites		rMCZ Whitsand and Looe Bay
<b>Source of costs of the rMCZ under Policy Option 1 and Policy Option 2</b>		
<p><b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications within 1km of an rMCZ. This applies to 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.</p> <p><b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to disposal of dredge material and future potential port developments. Additional mitigation of impacts on features protected by the rMCZ, relative to baseline provided in the baseline case, may be needed for future port developments.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2	
	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 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ Whitsand and Looe Bay
Commercial fishing (mid-water trawls, pots & traps, nets, hooks & 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

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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 <sup>18</sup>									rMCZ Whitsand and Looe Bay	
✓ = 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	✓	✓	✓	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				

<sup>18</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓	None	Maintain			
A3.1 High energy infralittoral rock	BSH	✓	✓	✓	None	Maintain			
A1.1 High energy intertidal rock	BSH	✓	✓	✓	None	Maintain			

A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
A2.4 Intertidal mixed sediments	BSH	✓	✓	✓	None	Maintain			
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓	None	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A1.3 Low energy intertidal rock	BSH	✓	✓	✓	None	Maintain			
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain			
Seagrass beds	FOCI Habitat	✓	✓	✓	None	Maintain			
Sea-fan anemone <i>Amphianthus dohrnii</i>	FOCI Species	✓	✓	✓	None	Maintain	This FOCI is currently only reaching the minimum replication target		
Ocean quahog <i>Arctica islandica</i>	FOCI Species	✓	✓	✓	None	Maintain			
Pink sea-fan <i>Eunicella</i>	FOCI Species	✓	✓	✓	None	Maintain			

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<i>verrucosa</i>									
Giant goby <i>Gobius cobitis</i>	FOCI Species	✓	✓	✓	None	Maintain	Species only recorded 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.



Annex I2. Site specific *Impact Assessment materials (Option 2)*

Stalked jellyfish <i>Haliclystus auricula</i>	FOCI Species	✓	✓	✓	None	Maintain			
Long-snouted seahorse <i>Hippocampus guttulatus</i>	FOCI Species	X	X	✓	This is one of only two sites proposed for short-snouted seahorse in the region.	Maintain			

Site considerations	
Connectivity	✓ * 1
Geological/Geomorphological features of interest	None

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Appropriate boundary	✓
Areas of Additional Ecological Importance	✓
Overlaps with existing MPAs	None

**Additional comments and site benefits:**

Presence of hard substratum species and presence of rocky ledges on detailed sidescan sonar indicate that this broad-scale habitat [moderate energy circalittoral rock] is present.

<sup>1</sup> The site is important in maintaining connectivity within the Finding Sanctuary regional project.

This site contains a diverse range of habitats and species, from intertidal sediment, to circalittoral rock and as such offers high value in representing a range of features.

The site includes an existing voluntary marine conservation area (Looe Bay) with associated management and interpretation in place.

Only a small proportion (<1%) of BSH subtidal sand is currently protected within existing MPAs in the FS 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 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 Whitsand and Looe Bay
Baseline	Beneficial impact under Policy Option 1	

Table 5a. Fish and shellfish for human consumption	rMCZ Whitsand and Looe Bay	
<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 rMCZ overlaps a nursery area for commercial fish species 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>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, 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. In particular it may improve benefits occurring through the site's nursery area function. If some fishing is permitted within the rMCZ, then catches may improve. Beneficial spill-over effects may occur around the rMCZ, particularly as a result of the improved nursery area function.</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 style="text-align: center;">↑</p> <p>Confidence: Low</p>
	<b>Beneficial Impact under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1)</p> <p>SNCBs advise that the conservation objective for the Sea fan anemone (<i>Amphianthus dohrnii</i>) and the Pink sea fan (<i>Eunicella verrucosa</i>) be changed from "maintain" to "recover". The other features of the site 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 Sea fan anemone and the Pink sea fan are not target species of commercial fishing activities, which means that an improvement in the status of these species will not necessarily result in the improvement of the provision of ecosystem service. However, it may improve the site's nursery area function, but it is unclear what the additional improvements are over and above what is already anticipated if this site is designated.</p>	<p>Anticipated direction of change:</p> <p>Unclear (relative to what is already expected prior to change in conservation objective)</p> <p>Confidence:</p>

Table 5a. Fish and shellfish for human consumption		rMCZ Whitsand and Looe Bay
		Low

Table 5b. Recreation		rMCZ Whitsand and Looe Bay
Baseline	Beneficial impact under Policy Option 1	
<p><b>Angling:</b> 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>Looe and Whitsand Bay are popular fishing locations. Species targeted include wrasse, conger, flatfish, ray, pollack, mackerel, whiting, dab, bass and shark. Local companies offer specialised boat trips such as for shark fishing. 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>
	Beneficial Impact under Policy Option 2	

Table 5b. Recreation	rMCZ Whitsand and Looe Bay	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1)</p> <p>SNCBs advise that the conservation objective for the Sea fan anemone (<i>Amphianthus dohrnii</i>) and the Pink sea fan (<i>Eunicella verrucosa</i>) be changed from “maintain” to “recover”, while the other features of the site will be maintained in favourable condition. Additional management (above that in the baseline situation) of commercial fishing activities is expected, the costs of which are set out in Table 2b.</p> <p>Management of commercial fishing activity within the rMCZ may reduce the on-site fishing mortality of species, which may benefit commercial stocks. In particular it may improve benefits occurring through the site’s nursery area function.</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>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>
<p><b>Diving:</b> 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>Whitsand Bay is popular with experienced divers and there are many wreck sites in the area. It has not been possible to estimate the value of diving in the rMCZ.</p>	<p><b>Beneficial Impact under Policy Option 1</b></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>	

Table 5b. Recreation	rMCZ Whitsand and Looe Bay	
	<b>Beneficial Impact under Policy Option 2</b>	
	<p><b>Possible changes in beneficial impacts under Option 2 due to change in conservation objectives:</b></p> <p>SNCBs advise that the conservation objective for the Sea fan anemone (<i>Amphianthus dohrnii</i>) and the Pink sea fan (<i>Eunicella verrucosa</i>) be changed from “maintain” to “recover”. The other features of the site will be maintained in favourable condition.</p> <p>The seafan anemone and the pink sea fan are draws for divers (Fletcher and other, 2012) and also contribute to species diversification and the formation of species habitat. The recovery of these features may improve the quality of diving in the site and therefore the value of the ecosystem service. A potential reduction in anthropogenic pressures, including the use of bottom-towed fishing gear, may increase site benthic biodiversity and biomass, further improving the diving experience.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>
<p><b>Wildlife watching:</b> 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 many walks and boat trips on offer for visitors to experience the local wildlife including great black gulls and grey seals. It has not been possible to estimate the value of wildlife watching in the rMCZ.</p>	<p><b>Beneficial Impact under Policy Option 1</b></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>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation		rMCZ Whitsand and Looe Bay	
		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.	
	<b>Beneficial Impact under Policy Option 2</b>		
		<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for the Sea fan anemone (<i>Amphianthus dohrnii</i>) and the Pink sea fan (<i>Eunicella verrucosa</i>) be changed from “maintain” to “recover”. The other 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, combined with a recovery in the condition of the seafan anemone and the pink sea fan may increase site benthic biodiversity and biomass, which may have knock on effects on the abundance and diversity of species that are visible to wildlife watchers, improving the wildlife watching experience at the site.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5c. Research and education		rMCZ Whitsand and Looe Bay
Baseline	Beneficial Impact under Policy Option 1 and Policy Option 2	

Table 5c. Research and education		rMCZ Whitsand and Looe Bay
<p><b>Research:</b> 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>A variety of research activities take place around the rMCZ. These have included the Marine Biological Association's cuttlefish tag survey, research on the potential environmental impacts of the nearby Rame Head disposal site, and mapping in Looe Voluntary Marine Conservation Area (VMCA) by Cornwall Wildlife Trust. 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 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><b>Education:</b> Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Cornwall Wildlife Trust runs a number of education events in and around the rMCZ, including guided walks and volunteer opportunities, with a particular focus on Looe Island and Looe VMCA. Glass-bottomed boats can be taken from nearby Looe Harbour to view the underwater marine wildlife. 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 Whitsand and Looe Bay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	



Table 5d. Regulating services		rMCZ Whitsand and Looe Bay
<p><b>Regulation of pollution:</b> 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><b>Environmental resilience:</b> 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><b>Natural hazard protection:</b> 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 are achieved the features 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 Whitsand and Looe Bay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5e. Non-use and option values	rMCZ Whitsand and Looe Bay	
<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>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. The most common reasons were the 'spectacular scenery', 'the whole place is amazing' and 'it means a great deal to me personally' ('It is my local coast and these sites are very beautiful'; 'I have been graced to see each of these larger sea creatures, and hold all the life in the Bay close to my heart. I would ask, plead, from the heart, for this Bay to be protected').</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**rMCZ 2, Stour and Orwell Estuaries****Site area (km<sup>2</sup>): 86.90**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts					rMCZ 2, Stour and Orwell Estuaries
1a. Ecological description					
<p>This recommended Marine Conservation Zone (rMCZ) would protect a large proportion of the low energy intertidal rock found in the Balanced Seas Project Area and a very high diversity of habitats and species compared with other UK estuaries (with over 250 taxa recorded). This richness is thought to be a result of the stable saline conditions in the estuaries. The rMCZ contains several examples of estuarine rocky habitats including an example of Harwich Stone Band (Cementstone/London Ashfall Clay Band) habitat, which is known only from the Stour, Orwell and Deben estuaries and which supports interesting algal communities. The rMCZ also has wild and unharvested native oyster beds, extensive blue mussel beds, sheltered muddy gravels, peat and clay exposures, populations of the tentacled lagoon worm and starlet sea anemone, and subtidal sands and gravels. It is one of only two sites in the Balanced Seas project area where honeycomb worm reef and Ross worm reef have been recorded together. The area is considered an important fish nursery throughout the year for several species, and the almost permanent presence of juvenile bass here is considered to be unprecedented among British estuaries.</p> <p>Source: Balanced Seas Final Recommendations (2011).</p>					
1b. Baseline condition of MCZ features and impact of the MCZ					
Feature	Area of feature (km <sup>2</sup> )	No. of occurrences	Baseline	Impact of the MCZ	
<b>Broad-scale Habitats</b>					
A1.3 low energy intertidal rock	0.61	-	Favourable condition	Maintain at favourable condition	
A2.4 intertidal mixed sediments	0.11	-	Favourable condition	Maintain at favourable condition	
A5.1 subtidal coarse sediment	31.11	-	Favourable condition	Maintain at favourable condition	
<b>Habitats of Conservation Importance</b>					
Blue mussel beds	0.58	-	Favourable condition	Maintain at favourable condition	
Estuarine rocky habitats	0.19		Favourable condition	Maintain at favourable condition	
Honeycomb worm ( <i>Sabellaria alveolata</i> ) reef	0.02		Unfavourable condition	Recover to favourable condition	
Oyster beds	0.59		Unfavourable condition	Recover to favourable condition	
Peat and clay exposures	0.01		Favourable condition	Maintain at favourable condition	
Ross worm ( <i>Sabellaria spinulosa</i> ) reef	0.45		Unfavourable condition	Recover to favourable condition	

Table 1. Conservation impacts			rMCZ 2, Stour and Orwell Estuaries	
Sheltered muddy gravels		28 records	Unfavourable condition	Recover to favourable condition
Subtidal sands and gravels	1.05		Favourable condition	Maintain at favourable condition
<p><b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>Subtidal coarse sediment, Honeycomb worm (<i>Sabellaria alveolata</i>) reef, Native Oyster beds, Rossworm (<i>Sabellaria spinulosa</i>) reef, Subtidal sands and gravels</p>				

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

Table 2a. Archaeological heritage		rMCZ 2, Stour and Orwell Estuaries
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></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> <p>However, restrictions could be placed on:</p> <ul style="list-style-type: none"> <li>• anchoring in areas of vulnerable MCZ features in the site, including Ross worm <i>Sabellaria spinulosa</i> reef;</li> <li>• archaeological excavation in areas of peat and clay exposures in the site.</li> </ul>		
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2
<p>Vessel wrecks of British, Dutch, German and French origin are recorded within the site. Two German aircraft are recorded within the site. There is evidence of iron-age or Roman salt workings, as well as artefacts of Roman, Mesolithic, Anglo Saxon, Medieval, Post Medieval, Viking, Palaeolithic and Iron Age date. Bronze-age dwellings have been recorded within the site, as well as cup and ring marks, earthworks, ditches and caves (English Heritage, 2012).</p> <p>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).</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, depending on the size of the MCZ (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.</p> <p>If archaeologists respond to restrictions on excavation in areas of peat</p>

Table 2a. Archaeological heritage	rMCZ 2, Stour and Orwell Estuaries
	<p>and clay exposures and restrictions on anchoring over areas of sea grass or Ross worm <i>Sabellaria spinulosa</i> reef by undertaking alternative archaeological excavations 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, it is not costed in the Impact Assessment. If archaeological excavations do not take place as a result of these restrictions, this will prevent interpretation of archaeological evidence from the site which will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.</p>

Table 2b. Commercial fisheries	rMCZ 2, Stour and Orwell Estuaries
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></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. Two scenarios have been identified for the Impact Assessment which reflect this uncertainty. Should the site be designated, the management that will be required will fall somewhere within this range.</p> <p><b>Management scenario 1:</b> Zoned closure of Stour and Orwell Estuaries and inner part of Hamford Water to bottom trawls and dredges to protect areas of Ross worm <i>Sabellaria spinulosa</i> reef (Statutory Nature Conservation Bodies (SNCB) informed scenario).</p> <p><b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (SNCB informed scenario).</p> <p><b>Summary of all fisheries:</b> The rMCZ is wholly within 6nm (nautical miles) and is fished only by UK vessels. The commercial fishing fleet using this rMCZ operates out of Felixstowe Ferry, Shotley, Walton and Harwich. Most of these vessels are small, under 10 metre boats which tend to fish on 'day trips'. A variety of static and mobile gears are used within the area, allowing flexible and versatile fishing effort. Vessels trawl for sole during the summer and autumn, with plaice and ray forming an additional catch. Some effort then switches to cod and whiting until the end of the year, when several boats opt to use nets and lines rather than trawls. The majority of smaller boats join the lobster and crab potting fishery at the beginning of summer. There is a seasonal whelk fishery, and seasonal set and drift net fisheries for sole, bass and cod. Winter herring and sprat are targeted by trawl or drift nets if quota is available. Long lines are set for cod, ray and bass. Kent and Essex Inshore Fisheries and Conservation Authority (IFCA) and Eastern IFCA byelaws have closed the estuaries to</p>	

Table 2b. Commercial fisheries		rMCZ 2, Stour and Orwell Estuaries		
oyster dredging for about 2 years. Other IFCA commercial fishing restrictions also exist and are summarised in Annex E1. More detail on the approach used for the fisheries method is provided in Annexes H7 and N4.				
Estimated annual value of landings from the rMCZ: £0.045m/yr.				
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries under Policy Option 1 and Policy Option 2		
<b>Bottom trawls:</b> Vessel numbers unknown.		The estimated annual value of UK bottom trawl landings affected is expected to fall within the following range of scenarios:		
Estimated total value of landings from the rMCZ: £0.008m/yr (MCZ Fisheries Model).		£m/yr	Scenario 1	Scenario 2
		Value of landings affected	0.002	0.008
<b>Hooks and lines:</b> Vessel numbers unknown.		The estimated annual value of UK hook and line landings affected is expected to fall within the following range of scenarios:		
Estimated total value of landings from the rMCZ: £0.001m/yr (MCZ Fisheries Model).		£m/yr	Scenario 1	Scenario 2
		Value of landings affected	0.000	0.001
		In establishing the draft conservation objectives, the site’s features may have been assessed as having low vulnerability to fishing with hooks and lines at current levels and, where this is the case, this activity was not the primary reason for assigning the ‘recover’ conservation objectives. As such, it is anticipated that if additional 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.		
<b>Nets:</b> Vessel numbers unknown.		The estimated annual value of UK net landings affected is expected to fall within the following range of scenarios:		
Estimated total value of landings from the rMCZ: £0.027m/yr (MCZ Fisheries Model).		£m/yr	Scenario 1	Scenario 2
		Value of landings affected	0.000	0.027
		In establishing the draft conservation objectives, the site’s features may have been assessed as having low vulnerability to fishing with nets at current levels and, where this is the case, this activity was not the primary reason for assigning the ‘recover’ conservation objectives. As such, it is anticipated that if additional management is required it may be towards the lower end of the range, and is		

Table 2b. Commercial fisheries		rMCZ 2, Stour and Orwell Estuaries															
		likely to be less restrictive than that required for other gears.															
Total direct impact on UK commercial fisheries under Policy Option 1 and Policy Option 2																	
		<div>The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:</div> <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>0.036</td><td>0.003</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.016</td><td>0.001</td></tr></table> <div>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.</div>				£m/yr	Scenario 1	Scenario 2	Best estimate	Value of landings affected	0.000	0.036	0.003	GVA affected	0.000	0.016	0.001
£m/yr	Scenario 1	Scenario 2	Best estimate														
Value of landings affected	0.000	0.036	0.003														
GVA affected	0.000	0.016	0.001														
Baseline description of non-UK fisheries		Costs of impact of rMCZ on non-UK commercial fisheries															
		None.															

Table 2c. Ports, harbours, shipping and disposal sites	rMCZ 2, Stour and Orwell Estuaries
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b>	
<p><b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for disposal of dredged material, navigational dredging and known specific plans or proposals for port and harbour developments within 1km of the rMCZ. It is anticipated that additional mitigation of impacts on features protected by the rMCZ will be needed for port developments or port-related activities relative to the mitigation provided in the baseline.</p>	
<p><b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for</p>	

Table 2c. Ports, harbours, shipping and disposal sites		rMCZ 2, Stour and Orwell Estuaries		
disposal of dredged material, navigational dredging and all port and harbour developments within 5 km of the rMCZ. Also, additional costs incurred in updating the existing Maintenance Dredging Protocol (MDP) in order to assess impacts of activities on MCZ features. It is anticipated that additional mitigation of impacts on features protected by the rMCZ will be needed for port developments or port-related activities relative to the mitigation provided in the baseline.				
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2			
<p><b>Disposal sites:</b> There are 23 disposal sites within 1km of the rMCZ which are licensed for disposal of channel dredge material and are likely to be used by the ports of Felixstowe, Harwich and Ipswich. The average number of licence applications received for all of these disposal sites is 3.4 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011). For ten of these disposal sites, no licence applications were received between 2001 and 2010, but they are not closed to disposal in future (Cefas, pers. comm., 2011).</p> <p>There are 23 disposal sites within 5km of the rMCZ which are licensed for disposal of channel dredge material and are likely to be used by the ports of Felixstowe, Harwich and Ipswich. The average number of licence applications received for all of these disposal sites is 3.4 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011). For ten of these disposal sites, no licence applications were received between 2001 and 2010, but they are not closed to disposal in future (Cefas, pers. comm., 2011).</p> <p><b>Navigational dredge areas:</b> There are several dredged channels within 1km of the rMCZ associated with the Harwich Haven ports. It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal.</p> <p>There are several dredged channels within 5km of the rMCZ associated with the Harwich Haven ports. It is assumed that each dredge area's</p>				
	£m/yr		Scenario 1	Scenario 2
	Cost to the operator		0.025	0.029*
<p>* 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. Also, this figure assumes that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal (every 3 years). It does not include the cost of incorporating MCZ features in the existing MDP. It is likely to over-estimate the cost of Scenario 2 for rMCZs with ports within 5km that have MDPs because of the savings in future costs provided by an MDP. See Annex H for further information</p> <p><b>Scenario 1:</b> Future licence applications for disposal of material, navigational dredging and known port or harbour development plans or proposals within 1km of this rMCZ 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 (a breakdown of these by activity is provided in Annex N11).</p> <p>Although 10 of the disposal sites in the rMCZ have not been used in the last ten years, they might be used during the 20 year period covered by the IA. Future licence applications for disposal of material in these disposal sites will need to consider the potential effects of the activity on the features protected by the rMCZ</p>				



Table 2c. Ports, harbours, shipping and disposal sites	rMCZ 2, Stour and Orwell Estuaries
<p>marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal. As these navigational dredge areas are covered by an existing MDP, it is assumed that the assessment of environmental impact is not changed over the 20 year period of the IA.</p> <p><b>Port development:</b> Within 5km of the rMCZ there are 6 ports and harbours which may undergo development at some point in the future: Harwich Haven, Harwich International, Harwich Navyard, Felixstowe, Mistley and Ipswich (Ports &amp; Harbours UK, 2012). This may not represent a full list of all ports and harbours that could be impacted on by the site.</p> <p>The Haven Hub Master Plan aims to provide around 8 million twenty-foot equivalent units (TEUs) of container-handling capacity within the Harwich Haven by 2030, including Berths 8 and 9 (Felixstowe South Phase 1), the planned deep-water capability of Phase 2 of the Felixstowe South development (due in 2018) and the subsequent development of the (fully consented) Harwich International Container Terminal at Bathside Bay (Port of Felixstowe, 2011). The Haven ports are integral to Britain's transport infrastructure and are close to major sea lanes, providing minimum deviation (Harwich Haven Authority, 2011). The Port of Felixstowe handles over 40% of all UK containerised traffic. It is the largest container port in Britain and is the only port in the UK that can handle the new large container ships (Port of Felixstowe, 2011). The main approach channel, already 14.5 metres deep, is the deepest in all UK container ports. In addition to its national significance, the port also has an important role in the economic development of East Anglia and Harwich, Felixstowe and Ipswich (HHA, pers. comm., 2011). The developments described in the Haven Hub Master Plan will significantly increase the value of exports that pass through the port (currently estimated at £60,000m/yr) (Hutchison Ports, 2011).</p>	<p>Future mitigation of impacts on features protected by the rMCZ will be needed for proposed future port and harbour developments relative to the mitigation provided in the baseline. Unknown potentially significant costs of mitigation could arise.</p> <p><b>Scenario 2:</b> Future licence applications for disposal of material, navigational dredging and known port development plans and proposals within 5km of this rMCZ 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 (a breakdown of these by activity is provided in Annex N11).</p> <p>An additional cost will arise to update the existing MDP as this will need to consider the potential effects of activities on the features protected by the rMCZ. The anticipated additional cost in the MDP is estimated to be a one-off cost of £8438.</p> <p>Sufficient information is not available to identify what additional mitigation of impacts on features protected by the MCZ will be needed for proposed future port and harbour developments relative to the mitigation provided in the baseline. Unknown potentially significant costs of mitigation could arise.</p>

Table 2d. Recreational anchoring		rMCZ 2, Stour and Orwell Estuaries
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></p> <p>Creation of no-anchoring zones for recreational vessels (except in emergency circumstances) over sensitive features (Ross worm <i>Sabellaria spinulosa</i> and honeycomb worm <i>Sabellaria alveolata</i>).</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2	
<p>The Stour and Orwell Estuaries are a popular destination for recreational boaters, and in the rMCZ there are 7 sailing clubs representing over 3,000 members, and 6 marinas maintaining over 1,600 berths and 110 swinging moorings (<a href="#">Visit my Harbour</a> and <a href="#">RYA</a> websites). The main approach channel for recreational vessels into the estuaries is through the mid channel, and vessels waiting to enter the estuaries may drop anchor in this area (Essex Sites Meeting Report, July).</p> <p>The shelf area that is used throughout the season for dinghy racing may overlap with areas of <i>Sabellaria</i>. Race marker buoys are laid for the racing. There is no equivalent area nearby for this activity (RYA Balanced Seas Impact Assessment (BS IA) Response, January 2012).</p> <p>Project data (survey by the Environment Agency as part of a national contract; Unicomarine surveys via Harwich Haven Authority) show the habitat features of conservation importance Ross worm <i>Sabellaria spinulosa</i> and honeycomb worm <i>Sabellaria alveolata</i> occur within the mouth of the Stour and Orwell Estuaries from mid channel to just off the shore south of the Harwich Haven Jetty. There is a recreational anchorage in this location where vessels may anchor for an hour or two before entering the estuaries. Recreational water sports and sea anglers' representatives on the Regional Stakeholder Group (RSG) and Local Groups do not think the area where the features occur is used much for anchoring as it is highly exposed and not particularly visually attractive. StakMap indicated that only one club has an anchoring area overlapping the <i>Sabellaria</i>.</p>	<p>As there is little or no anchoring over the current known extent of <i>Sabellaria</i>, Scenario 1 is not expected to impact recreational boat anchoring significantly and no significant costs are expected.</p> <p>If it transpires that race marker buoys are currently set in the areas of <i>Sabellaria</i>, the location of the marker buoys would need to be altered so that they do not coincide with the <i>Sabellaria</i> (K. Cook, Natural England, pers. comm., 2012). If it is not possible to alter the course so that marker buoys do not impact on the <i>Sabellaria</i>, racing in the site would cease. This would significantly impact on people who race in the site as there are no alternative areas for racing nearby (RYA BS IA 3<sup>rd</sup> Tranche Feedback, February). It could also impact indirectly on local businesses through reduced expenditure by the dinghy racers.</p> <p>The Suffolk/Essex/North Kent Local Group and RSG recommended that a survey be undertaken before designation as they had low confidence in the <i>Sabellaria</i> data. If <i>Sabellaria</i> is found to be more widespread within the rMCZ, a greater number of no anchoring zones would be needed, thus potentially impacting the anchoring of more recreational vessels and installation of eco-moorings might need to be considered if suitable sites are available. Survey costs have been included in monitoring costs in Annex N12.</p>	

Table 2d. Recreational anchoring	rMCZ 2, Stour and Orwell Estuaries
<p>In addition there are 6 unlicensed moorings above the stone pier below Harwich Haven Jetty (these may not overlap with the <i>Sabellaria</i> data point but this cannot be confirmed at this time), but fewer than 5 vessels moor there at any one time and mooring is sporadic depending on weather (Natural England Stakeholder Interview for rMCZ Reference Area 24 Harwich Haven, November 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 recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 2, Stour and Orwell Estuaries
<p>Commercial fishing (pots and traps, mid-water trawls, collection by hand)  Flood and coastal erosion risk management (coastal defence)  Recreation (except the activities listed above in table 2)  Research and education  Shipping  Water abstraction, discharge and diffuse pollution*.</p>	

\* The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>19</sup>	rMCZ 2, Stour and Orwell Estuaries
<p>✓ = ENG guideline is achieved and X = ENG guideline is not achieved. Green cells represent key considerations and any greyed-out rows indicate</p>	

<sup>19</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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
A1.3 Low energy intertidal rock	BSH	✓	✓	✓	None	Maintain	Joint highest contributing site for adequacy (with The Swale).	Joint highest contributing site for adequacy (with The Swale).	
A2.4 Intertidal mixed sediments	BSH	✓	✓	✓	None	Maintain			
A5.1 Subtidal coarse sediment	BSH	✓	✓ * 1	✓	None	Maintain	This BSH is currently only reaching the minimum adequacy target.	Significantly contributes to adequacy target.	
Blue mussel <i>Mytilus edulis</i> beds	FOCI Habitat	✓	✓	✓	None	Maintain			OSPAR habitat and BAP habitat - UK obligation, decline, functional habitat
Estuarine rocky habitats	FOCI Habitat	✓	✓	✓	None	Maintain		One of the best examples in the region especially for Harwich Stone Band (cement stone)	BAP habitat - UK obligation, decline, functional habitat, key species

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Honeycombworm <i>Sabellaria alveolata</i> reefs	FOCI Habitat	✓	✓	✓	None	Recover	One of only two records in the region.	One of only two sites where both species of <i>Sabellaria</i> have occurred together	BAP habitat
Native oyster <i>Ostrea edulis</i> beds	FOCI Habitat	✓	✓	✓	None	Recover			OSPAR habitat
Peat and clay exposures	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat - key species, functional habitat
Ross worm reefs <i>Sabellaria spinulosa</i>	FOCI Habitat	✓	✓	✓	None	Recover		One of only two sites where both species of <i>Sabellaria</i> have occurred together.	BAP and OSPAR habitat
Sheltered muddy gravel	FOCI Habitat	✓	✓	✓	None	Recover			BAP habitat
Subtidal sand and gravels	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				✓					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * 2					
Overlaps with existing MPAs				✓					

**Additional comments and site benefits:**

- <sup>1</sup> For the BSH subtidal coarse sediments, the adequacy target is at its minimum, and this site contains the 4th largest area of it.

- <sup>2</sup> Spawning and nursery grounds for flat fish, tentacled lagoon worm, starlet sea anemone (Natural England 2003), important site for juvenile bass population (Balanced Seas 2011a).
- The rMCZ and recommended reference area [Harwich Haven] provides for one of the most distinctive examples of FOCI habitat Estuarine rocky habitats in the biogeographic region (Brodie, et al. 2007).
- The European eel is noted as [one of] the most important taxa in the estuaries (Worsfold 2002). The EA survey data also shows these estuaries support populations of smelt. They are also fish nursery areas for herring, bass, flounder and sole. The variety of habitats around this area provides important feeding grounds and refuge for juvenile sea bass. It is a primary area for Sole nursery and spawning grounds (Balanced Seas 2010b).
- The estuaries have relatively high species richness and diversity (Dyer 1997), and are a Key Inshore Biodiversity Area according to the South-East England Biodiversity Forum 2010 (Seeley, Lear, et al. 2010).
- The sites support little terns and Mediterranean gull as foraging grounds (Balanced Seas 2010b).
- The sites are important Plant Area for algae (Brodie, et al. 2007).
- There are wild and unharvested native oysters in the estuaries (Balanced Seas 2011a).

### 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 2, Stour and Orwell Estuaries	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2		
<p>Fletcher and others (2011) 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.</p> <p>Intertidal rock habitats are important sources of larval plankton upon which commercially important fish species feed, including mussels and larval fish of plaice and mackerel (Fletcher and others, 2011).</p> <p>The estuaries have extensive wild native oyster and blue mussel beds, and are also commercial fish nursery areas. They have an almost permanent</p>	<p>If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some recovered to favourable condition.</p> <p>New management of fishing activities is expected (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>As most of the commercial species targeted by fishers in</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>	

Table 5a. Fish and shellfish for human consumption	rMCZ 2, Stour and Orwell Estuaries
<p>presence of juvenile bass all year round (Balanced Seas Final Recommendations Report, 2011). As such the rMCZ is likely to help to support potential on-site and off-site fisheries.</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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>There is a low level of commercial fishing in the estuaries. The small fleets at Harwich and Felixstowe Ferry operate in the estuaries' sheltered waters when poor weather limits their ability to work offshore. They trawl and net in the lower reaches of the estuaries for species such as Dover sole, brown shrimp and bass. A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p> <p>It has not been possible to estimate the value of the off-site benefits that derive from the spawning and nursery area.</p>	<p>this area are mobile flatfish, 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>Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.</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.</p>


Table 5b. Recreation	rMCZ 2, Stour and Orwell Estuaries
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2
<p><b>Angling:</b> Fletcher and others (2011) 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>Intertidal rock habitats are important sources of larval plankton upon which important fish species feed, including mussels and larval fish of plaice and mackerel (Fletcher and others, 2011).</p> <p>Both estuaries are important nursery areas for fish caught recreationally, including bass (Balanced Seas Final Recommendations Report, 2011).</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>Maintenance of the broad scale habitats in favourable condition may ensure their functioning as a nursery area, potentially benefiting fisheries exploited within and outside the rMCZ.</p> <p>As no additional management of angling is expected, fishers will be able to benefit from any on-site and off-site beneficial</p> <p>Anticipated direction of change:  </p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ 2, Stour and Orwell Estuaries	
<p>Both boat and shore angling for mullet and bass takes place throughout the rMCZ. Shore angling is particularly popular with local anglers off the stone pier at Harwich. The nursery grounds in the estuaries, as well as juvenile and adult fish from the estuaries, may contribute to the good fish populations found in the system of sand banks and channels just outside the site in the Outer Thames Estuary, which is popular with private and charter boat anglers fishing for numerous species including mackerel, dogfish and ray (Stakmap, 2010). The generally high biodiversity due to the intertidal habitats within the site may also support on-site and off-site fisheries.</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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site that results from the potential spawning and nursery area.</p>	<p>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>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.</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 an overall increase in UK angling and/or a redistribution of location preferences.</p>	
<p><b>Diving:</b> Diving is not known to take place in the rMCZ.</p>	N/A	N/A
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>Macroinvertebrates are an essential link between high trophic levels (e.g. fish and birds) and low trophic levels (e.g. algae) on intertidal rock habitat (Fletcher and others, 2011). Rock pools are particularly important habitats of intertidal rock that attract visitors to the marine environment (Fletcher and others, 2011).</p> <p>The baseline quantity and quality of the ecosystem service provided is</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>The recovery of the broad scale habitats to favourable condition may improve their functioning as support for fish, bird and marine mammal populations. 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>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>



Table 5b. Recreation	rMCZ 2, Stour and Orwell Estuaries	
<p>assumed to be commensurate with that provided by the features of the site when some are in in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>The banks of the Orwell and the north side of the Stour have particularly high biodiversity, and abundant fish populations which support a number of internationally important foraging birds. Birdwatching is very popular and the RSPB manages a reserve along the Stour Estuary designed for this activity.</p> <p>It has not been possible to estimate the value derived from wildlife watching in the rMCZ.</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 wildlife watching trips at the national scale.</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.</p>	
<p><b>Other recreation:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The banks of the Orwell and the north side of the Stour lie within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty. The estuaries and their surroundings attract visitors from nearby Colchester, Ipswich and Felixstowe and much further afield. Marinas and jetties are found along the banks, providing access to and from the tidal waters for recreational and tourist activities. The Harwich Area Sailing Association has a large membership and the clubs organise regattas and a series of races that attract visitors (Stour &amp; Orwell Estuaries Management Strategy, 2010). Coastal walking is popular within the rMCZ with 42 miles of promoted long distance paths including the Stour and Orwell Path and the Essex Way (<a href="#">Long Distance Walkers Association website</a> and Stour &amp; Orwell Estuaries Management Strategy, 2010).</p> <p>It has not been possible to estimate the value derived from other recreation in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, some of the features will recover to favourable condition. Others will be maintained in favourable condition.</p> <p>If the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by the tourism and leisure industry and that would be expected to increase visitation rates.</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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5c. Research and education		rMCZ 2, Stour and Orwell Estuaries	
Baseline		Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services.</p> <p>Suffolk and Essex Wildlife Trusts conduct research within the rMCZ and are part of the Stour and Orwell Estuary Management Group (SOEMG), a multi-sectoral group with a number of research programmes under way oriented to improving the management of the estuaries, and exploring opportunities to improve visitor experience. Harwich Haven and the Eastern Inshore Fisheries and Conservation Authority (EIFCA) both conduct regular research as part of their statutory duties. The results of any research are shared and utilised by SOEMG (Stour &amp; Orwell Management Strategy, 2009).</p>	<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>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence:</p> <p>High</p>	
<p><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Guided walks and educational activities are organised in the Orwell Country Park adjacent to the rMCZ by Ipswich Borough Council. SOEMG is working with young people to increase understanding of the estuaries. Essex and Suffolk Wildlife Trusts both have small reserves along the banks of the estuary which are open to visitors (Essex and Suffolk Wildlife Trusts' websites).</p>	<p>MCZ designation may provide an opportunity to expand the focus of education events into the marine environment.</p> <p>Designation may aid additional local (to the rMCZ) provision of education activities (e.g. events, interpretation boards), from which visitors would derive benefit.</p> <p>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:</p> <p>Moderate</p>	

Table 5d. Regulating services		rMCZ 2, Stour and Orwell Estuaries	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2		
<b>Regulation of pollution:</b> the features of the site contribute to the bioremediation of waste (Blue Mussel beds), water purification ( <i>Sabellaria</i> , Blue Mussel beds and native oyster) and sequestration of carbon (native	If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some ( <i>Sabellaria</i> reefs, Native oyster beds and sheltered muddy gravels)	Anticipated direction of change:	

Table 5d. Regulating services		rMCZ 2, Stour and Orwell Estuaries
<p>oyster, sheltered muddy gravels, subtidal coarse sediment) (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> The features of the site, in particular intertidal rock, native oyster and <i>Sabellaria</i>, contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p><b>Natural hazard protection:</b> The features of the site (native oyster, blue mussel beds and <i>Sabellaria</i>) contribute to local flood and storm protection (Fletcher and others, 2011).</p> <p>It has not been possible to estimate the value derived from regulating services associated with the rMCZ.</p>	<p>recovered to favourable condition.</p> <p>Recovery of <i>Sabellaria</i> reefs, Native oyster beds and sheltered muddy gravels and a potential reduction in the use of bottom towed fishing gear may increase the site's benthic biodiversity and biomass, improving the regulating capacity its habitats.</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.</p>	<p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ 2, Stour and Orwell Estuaries
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 rMCZ and the ecosystem services provided, even if they do not currently benefit from them.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with 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 MPAs. 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>Confidence: Moderate</p>

Site area (km<sup>2</sup>): 304.97**rMCZ 3 Blackwater, Crouch, Roach and Colne Estuaries**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, the draft conservation objective for one feature in this site has been changed from what was established by the Regional Projects. These changes and their impacts on management and costs are reflected under Policy Option 2.

Table 1. Conservation impacts	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
<p><b>1a. Ecological description</b></p> <p>This recommended Marine Conservation Zone (rMCZ) covers four estuaries from their tidal limit to where they join together and meet the Outer Thames Estuary. It is considered the most important area for both wild and cultivated native oysters in the Balanced Seas Project Area with very extensive beds in the Blackwater and Colne, and lesser although important beds within the Crouch and Roach. The rMCZ is the only place where the lagoon sea slug occurs in the Balanced Seas Project Area. The rMCZ is an important spawning and nursery ground for sand-smelt and bass (the salt marsh provides the optimum nursery ground for the early life stages of these species). The main spawning site of the Blackwater (or Thames) herring, a distinct coastal population of herring which breeds in spring (unlike offshore herring populations which breed in autumn) occurs here, as well as spawning areas for grey mullet, thornback ray, stingray, sole and brown shrimp, and nurseries for tope shark, whiting and sprat. Salmon, sea trout and eel occur in the site. The area is also an important foraging area for birds, particularly black-headed gull and brent goose, and a haul-out and pupping site for over 100 grey seals. There are also important geological features (such as Clacton Cliffs and Foreshore), fossils and rare species (e.g. algae) on rocky outcrops. This rMCZ lies within several existing designations including the Essex Estuaries Special Area of Conservation, Blackwater Estuary Site of Special Scientific Interest (SSSI), Colne Estuary SSSI, Crouch and Roach Estuary SSSI and Dengie SSSI due to the areas extensive nationally and internationally important wetlands and associated bird populations.</p> <p>Source: Balanced Seas Final Recommendations (2011).</p>	
<b>1b. Baseline condition of MCZ features and impact of the MCZ</b>	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 1. Conservation impacts			rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
Feature	Area of feature (km2)	No. of occurrences	Baseline	Impact of the MCZ
<b>Broad-scale Habitats</b>				
A1.1 high energy intertidal rock	0.09		Favourable condition	Maintain at favourable condition
A2.2 intertidal sand/muddy sand	2.17		Favourable condition	Maintain at favourable condition
A2.4 intertidal mixed sediments	0.08		Favourable condition	Maintain at favourable condition
<b>Habitats of Conservation Importance</b>				
Native Oyster ( <i>Ostrea edulis</i> ) beds	1 m <sup>2</sup>		Favourable condition	Maintain at favourable condition
<b>SNCB advice recommends that the conservation objective for Native Oyster (<i>Ostrea edulis</i>) beds is changed from “Maintain” to “Recover”. Therefore Option 2 uses the conservation objective “Recover to favourable condition” for this feature</b>				
<b>Species of Conservation Importance</b>				
European Eel ( <i>Anguilla anguilla</i> )	n/a		Favourable condition	Maintain at favourable condition
Lagoon Sea Slug ( <i>Tenellia adspersa</i> )		2 records	Favourable condition	Maintain at favourable condition
Native Oyster ( <i>Ostrea edulis</i> )		17 records	Favourable condition	Maintain at favourable condition
<b>SNCB advice recommends that the conservation objective for Native Oyster (<i>Ostrea edulis</i>) is changed from “Maintain” to “Recover”. Therefore, Option 2 uses the conservation objective “Recover to favourable condition” for this feature.</b>				
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Intertidal mixed sediments; lagoon sea slug; European Eel; Clifton Cliffs and Foreshore				

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

Table 2a. Archaeological heritage		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
Source of costs of the recommended Marine Conservation Zone (MCZ) under Policy Option 1 and Policy Option 2		
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 and Policy Option 2	
Several World War II defence aids/structures are recorded within the site including	An extra cost would be incurred in the assessment of environmental	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 2a. Archaeological heritage	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
<p>a bombing decoy site and pillboxes. A Neolithic settlement with burial remains is located within the site, as well as possible Neolithic cropmarks. Medieval, Roman, Bronze Age, Iron Age, Mesolithic, Neolithic and Anglo Saxon artefacts have been recorded in the site. Wrecked vessels of British, Irish and Norwegian origin are recorded within the site as well as British and German World War II aircraft wrecks. The Saxon coastal fish weir at Sales Point is a designated monument (English Heritage, 2012).</p> <p>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).</p>	<p>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 depending on the size of the MCZ (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.</p>

Table 2b. Coastal development (excluding ports and harbours)	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
<p><b>Source of costs of the recommended Marine Conservation Zone (MCZ) under Policy Option 1 and Policy Option 2</b></p> <p>Potential additional costs of assessing environmental impacts in future licence applications and provision of any mitigation that is required if the site of the existing Bradwell Nuclear Power Station is selected for construction of a new nuclear power station.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2
<p>The old Bradwell Nuclear Power Station is being decommissioned but the site is one of eight in the UK identified in 2010 as suitable for construction of a new nuclear power station (World Nuclear Association, 2012).</p>	<p>Until the site is selected for nuclear power station development and further information is available on the development, it is not possible to identify whether additional costs would be incurred for future licence applications as a result of an MCZ and whether mitigation of impacts on MCZ features may be required.</p>

Table 2c. National defence	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
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Source of costs of the recommended Marine Conservation Zone (MCZ) under Policy Option 1 and Policy Option 2			
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 and Policy Option 2	
MOD is known to make use of the rMCZ as a firing range including for the following activities: demolition of unexploded ordnance; explosive trials; machine gun firing; mortar firing; naval gunfire support; surface-to-surface firing; and weapon trials.		It is not known whether this rMCZ will impact on MOD's use of the site. Impacts of rMCZs on national defence are assessed in Annex H10 and N9 (they are not assessed for this site alone).	
Table 2d. Ports, harbours, shipping and disposal sites		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2			
<b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for disposal of dredged material and navigational dredging that takes place within 1km of the rMCZ. The Balanced Seas project is not aware of activities related to ports, harbours and shipping for which additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline.			
<b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for disposal of dredged material, navigational dredging and all port and harbour developments within 5 km of the rMCZ. Also, additional costs incurred in including MCZ features in a potential new MDPs for ports within 5km of the rMCZ. The Balanced Seas project is not aware of activities related to ports, harbours and shipping for which 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 and Policy Option 2	
Disposal sites: Within 1 km of the rMCZ there are three sites (TH062 Maldon Saltings, TH212 Alresford Saltings and TH215 Wivenhoe Overflow) which are licensed for disposal of channel dredge material. These are likely to be used by the ports of Brightlingsea, West Mersea and Tollesbury. The average number of licence applications received	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.006	0.009*
	* 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		

Table 2d. Ports, harbours, shipping and disposal sites	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
<p>for all of these disposal sites is 0.5 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011). For two of the disposal sites no licence applications were received between 2001 and 2010, but these are not closed to disposal in future (Cefas, pers. comm., 2011).</p> <p>Within 5km of the rMCZ, there are the same three sites (TH062 Maldon Saltings, TH212 Alresford Saltings and TH215 Wivenhoe Overflow) which are licensed for disposal of dredged material. The average number of licence applications received for all of these disposal sites in total is 0.5 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011). For two of the disposal sites no licence applications were received between 2001 and 2010, but these are not closed to disposal in future (Cefas, pers. comm., 2011).</p> <p><b>Navigational dredge areas:</b> Within 1km of the rMCZ, there are various licensed dredged channels associated with Bradwell Marina, Bradwell Waterside, Brightlingsea, West Mersea and Tollesbury, and Crouch Harbour Authority. It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal.</p> <p>Within 5km of the rMCZ there are additional channels that are dredged including Bradwell Creek and Bradwell Waterside. It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal. As these navigational dredge areas will be covered by a potential new MDP, it is assumed that assessment of environmental impact is not changed over the 20 year period of the IA.</p>	<p>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.</p> <p><b>Scenario 1:</b> Future licence applications for disposal of material and navigational dredging within 1km of this rMCZ 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 (a breakdown of these by activity is provided in Annex N11).</p> <p>Although two of the disposal sites rMCZ have not been used in the last ten years, they might be used during the 20 year period covered by the IA. Future licence applications for disposal of material in these disposal sites will need to consider the potential effects of the activity on the features protected by the rMCZ.</p> <p><b>Scenario 2:</b> Future licence applications for disposal of material, navigational dredging and known port or harbour development plans or proposals within 5km of this rMCZ 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 (a breakdown of these by activity is provided in Annex N11).</p> <p>Additional costs will also arise to include MCZ features in a potential new MDP to consider the potential effects of activities on the features protected by the rMCZ. The anticipated additional cost in the MDP is estimated to be a one-off cost of £8438.</p>



Table 2d. Ports, harbours, shipping and disposal sites	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
<p><b>Port development:</b></p> <p>There are 6 ports and harbours within 5km of the rMCZ which could potentially undergo development at some point in the future: Brightlingsea, Burnham-on-Crouch, Wivenhoe, Fingringhoe, Maldon and Rochford (Ports &amp; Harbours UK, 2012). This may not represent a full list of all ports and harbours impacted by the site. No port developments are known to be planned within the 20 year period of the Impact Assessment (IA).</p>	

Table 2e. Renewable energy – wind energy		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2			
<b>Management scenario 1:</b> 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).			
<b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications and increase in cable protection installation 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 and Policy Option 2		
For the purpose of the IA, it was estimated 38km of proposed and consented export cable routes from the Gunfleet 3 – Demonstration Project wind farm overlap with the rMCZ (estimate based on the length of rMCZ in the absence of information on the cable route).  It is now recognised that this overlap will be significantly shorter as the cable will make land fall near Clacton.	£m/yr	Scenario 1	Scenario 2
	GVA affected	0.001	0.607*
	*Estimate differs from the regional project estimate (published 18 <sup>th</sup> July 2011) as the length of the cable recent published information which shows the cable route to be around 10-12 km.		
	<b>Scenario 1:</b> As a result of the designation of the rMCZ, the operator may incur additional costs in assessing environmental impacts for future licence applications.		
	This is expected to result in an additional one-off cost of £0.012m in 2022 (for extra		

Table 2e. Renewable energy – wind energy	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
	<p>consultant/staff time) with a present value of £0.009m.</p> <p><b>Scenario 2:</b> In addition to the increased costs for assessment set out under Scenario 1, under Scenario 2 costs of additional mitigation are anticipated. This additional mitigation entails use of alternative cable protection for export cables and inter-array cables that have not yet been consented. This is expected to result in an additional one-off cost of £38.392m in 2022 (based on estimated additional cost of £1m/km for yet-to-be-consented power export cable route only) with a present value of £27.217m. These costs are included in Scenario 2 to reflect uncertainty over whether this additional mitigation will be required. Inter-array cables are not expected to be proposed for installation within this rMCZ. Therefore, no additional cost to install alternative cable protection for inter-array cabling is anticipated. JNCC and Natural England (pers. comm., 2012) state that the likelihood of the cost in Scenario 2 occurring is very low. Further details are provided in Annex H14.</p> <p>These figures are recognised as being an overlap given that the actual length of the cable route is shorter than was estimated.</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 2f: Commercial fishing	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
<p><b>Source of costs of the rMCZ</b></p> <p><b>Policy Option 1</b> No management anticipated, based on the Regional Project draft Conservation Objectives (and therefore no costs are anticipated).</p> <p><b>Policy Option 2</b> SNCB Advice [insert reference] recommends that the conservation objective for Native Oyster (<i>Ostrea edulis</i>) beds is changed from “Maintain” to “Recover to</p>	

Table 2f: Commercial fishing		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries							
favourable condition”. This may require management measures for commercial fisheries in Option 2 above those assumed for Option 1 (the Regional Project recommendations)									
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. Two scenarios have been employed in the Impact Assessment (IA) for these fisheries in order to reflect this uncertainty: open to certain gear types and closure of the fishery within the site. Should the site be designated, the management that will be required will fall somewhere within this range.									
<b>Management scenario 1:</b> No additional management									
<b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls and dredges									
<b>Summary of all fisheries:</b> Estimated annual value of landings from the rMCZ: £1.790m/yr (MCZ Fisheries Model).									
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries under Policy Option 2							
<b>Bottom trawls:</b> Number of vessels unknown.  Estimated total value of landings from the rMCZ: £0.053m/yr (MCZ Fisheries Model).		Native oyster is not sensitive to bottom trawling, therefore the change in conservation objective means that there will be no impacts on annual value of landings.							
<b>Dredges:</b> Number of vessels unknown.  Estimated total value of landings from the rMCZ: £1.703m/yr (MCZ Fisheries Model).		Estimated annual value of UK vessel landings affected: <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>1.703</td></tr></table>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	1.703
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	1.703							
Total direct impact on UK commercial fisheries under Policy Option 2									
		Estimated annual value of UK vessel landings and gross value added (GVA)							

Table 2f: Commercial fishing		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries		
	£m/yr	Scenario 1	Scenario 2	Best Estimate
	Value of landings affected	0.000	1.703	0.213
	GVA affected	0.000	0.809	0.101
	<p>affected:</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>			
Baseline description of non-UK fisheries		Costs of impact of rMCZ on non-UK commercial fisheries under Policy Option 2		
		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 recommended Marine Conservation Zone (MCZ) (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 3 Blackwater, Crouch, Roach and Colne Estuaries
<b>Policy Option 1</b> Aquaculture Commercial fishing (bottom trawls, dredges, hooks and lines, mid-water trawls, nets, pots and traps, collection by hand) Flood and coastal erosion risk management Recreation Research and education Shipping Water abstraction, discharge and diffuse pollution*.	

**Policy Option 2**

Aquaculture

Commercial fishing (bottom trawls, hooks and lines, mid-water trawls, nets, pots and traps, collection by hand)

Flood and coastal erosion risk management

Recreation

Research and education

Shipping

Water abstraction, discharge and diffuse pollution\*.

\*The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>20</sup> ✓ = 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 <i>italics</i> 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 3 Blackwater, Crouch, Roach and Colne Estuaries	
ENG Feature	Represent- ativity	Replicati- on	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	

<sup>20</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A1.1 High energy intertidal rock	BSH	✓ * 1	✓	✓	None	Maintain	This BSH is currently only reaching the minimum replication target		
A2.4 Intertidal mixed sediments	BSH	✓	✓	✓	None	Maintain			
Native oyster <i>Ostrea edulis</i> beds	FOCI Habitat	✓	✓	✓ * 2	None	<i>Maintain</i>		This is the most important area for both wild and cultivated native oyster in the project region.  Essex University monitor the Colne Estuary.	OSPAR
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓ * 2	None	<i>Maintain</i>		This is the most important area for both wild and cultivated native oyster in the project	BAP and OSPAR species

Annex I2. Site specific *Impact Assessment materials (Option 2)*

								region. This feature is not protected in existing MPAs	
Lagoon sea slug <i>Tenellia adspersa</i>	FOCI Species	✓	✓	✓	Replication is not met for this FOCI species	Maintain	This is the only record of <i>Tenellia</i> in the region.	This feature is not protected in existing MPAs.	BAP species and listed on schedule 5 of the Wildlife and Countryside Act
European eel <i>Anguilla anguilla</i>	FOCI Mobile Species	✓	✓	N/A	None	Maintain		Not protected by existing designations at RP and biogeographical level.	BAP and OSPAR species
Site considerations									
Connectivity			✓						
Geological/Geomorphological features of interest			Clacton GCR geological feature * 3						
Appropriate boundary			✓						
Areas of Additional Ecological Importance			✓ * 4, 5, 6, 7						
Overlaps with existing MPAs			✓						

**Additional comments and site benefits:**

- <sup>1</sup> This is one of only two rMCZs protecting high energy intertidal rock.
- <sup>2</sup> Anecdotal local knowledge suggests a much larger population, although the scientific data did not exist at the time of proposal. This data is now being collected by Essex Wildlife Trust and the Blackwater Oystermen (Essex Wildlife Trust 2012)
- <sup>3</sup> The site includes Clacton Cliffs and Foreshore geological feature which is part of the Clacton GCR.
- <sup>4</sup> The site [is an] important spawning and nursery area for a number of fish including thornback ray, whiting, sole, sprat, grey mullet and the Blackwater Herring, a unique species, as well as Brown shrimp which spawn here (Balanced Seas 2011a).
- <sup>5</sup> Important foraging area for birds such as the black-headed gull (Balanced Seas 2011a).
- <sup>6</sup> The area is an area of high benthic biotope richness (Seeley, Lear, et al. 2010), and a Key Inshore Biodiversity Area according to the South-East England Biodiversity Forum 2010 (South East England Biodiversity Forum (SEEBF) 2010).
- <sup>7</sup> Haul-out and pupping sites for grey seal (Balanced Seas 2011a).
- This is a highly biodiverse area containing a number of species spending important life stages in the estuaries (Balanced Seas 2011a).
- The geological feature contains important fossils and rare species (Balanced Seas 2011a).

**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.

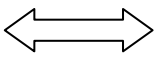
Table 5a. Fish and shellfish for human consumption		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
Baseline	Beneficial impact under Policy Option 1		
<p>Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption.</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 (see Table 1 for details).</p> <p>The main commercial fisheries within the site are for native oysters and Pacific oysters by the Blackwater Oystermen in the Blackwater Estuary and Colchester Oyster Fisheries in the Colne Estuary, both of which are high value fisheries. Native oysters have been cultivated and harvested in this site since Roman times and have been managed by the Blackwater Oystermen since the early 1980s. The quality of the native oysters is nationally renowned and this species commands a high price (significantly higher than the price for Pacific oysters). Other commercial fisheries in the site are for cockles, whelks and to a much lesser degree pelagic and demersal fish. The total value of landings derived from commercial fisheries within this site is £1.790m/yr (MCZ Fisheries Model).</p> <p>All four estuaries, and particularly the Blackwater Estuary, are important spawning and nursery grounds for commercial fish (including mullet, thornback ray, sole and brown shrimp) and nursery grounds for whiting and sprat. The salt marsh provides optimum conditions for early life stages of many of these species. The rMCZ is also the main spawning site of a distinct coastal population of herring, the Blackwater (or Thames) herring. Salmon, sea trout and eel also occur in the site (Balanced Seas Final Recommendations Report, 2011).</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No additional management (above that in the baseline situation) of fishing activities is expected. However, maintaining and monitoring the current sustainable fishing practices will safeguard the healthy population of native oyster and by ensuring no increase in fishing activity occurs or alternative gears used, it is expected that the native oyster population may increase over time and populations of the invasive Pacific oyster be kept to a minimum. The Blackwater Oystermen consider the protection of the habitat and marine wildlife as the key mechanism for ensuring the future of the species and the sustainability of the fishery.</p> <p>No change in feature condition or harvesting of fish and shellfish is anticipated and therefore no impact on on-site or off-site benefits 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.</p>	<p>Anticipated direction of change:</p> <p></p> <p>Confidence: Moderate</p>	
	Beneficial Impact under Policy Option 2		
		<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p>	<p>Anticipated direction of change:</p> <p>Unclear</p>

Table 5a. Fish and shellfish for human consumption		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
	<p>SNBCs recommend that the conservation objectives for the Native oyster <i>Ostrea edulis</i> and Native oyster beds be changed from “maintain” to “recover”. If the conservation objectives for the features within this site are achieved, then other features will be maintained at favourable condition while Native oysters and native oyster beds will recover to favourable condition.</p> <p>The main commercial fishery in this site is for native oysters and Pacific oysters by the Blackwater Oystermen in the Blackwater Estuary and Colchester Oyster Fisheries in the Colne Estuary, both of which are high value fisheries. Table 2f shows the potential additional management considered for commercial fisheries in this site, but these are only illustrative and are not what SNBCs recommend to be implemented in the site. It is not clear if additional management is indeed needed in the site since oyster fishermen already consider the protection of the habitat and marine wildlife as the key mechanism for ensuring the future of the species and the sustainability of the fishery. If the site is closed off to bottom trawls and dredges in order to allow the Native oyster and Native oyster beds to recover to favourable condition, then the benefits derived by the fisheries within this area may decline since these fishermen will not be allowed to access this site even though the stock of oysters increase. On the other hand, the additional protection of these features may result in positive impacts on the fishery itself since important habitats are protected, and these may have spill-over effects.</p>	<p>(relative to the change expected under Policy Option 1)</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
Baseline	Beneficial impact under Policy Option 1	
<b>Angling:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.	Anticipated direction of


Table 5b. Recreation	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
<p>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 (see Table 1 for details).</p> <p>All four estuaries (particularly the Blackwater Estuary) are important spawning and nursery grounds for fish caught recreationally (including bass, mullet, thornback ray, stingray and sole) and nursery grounds for tope shark and whiting. The salt marsh provides the optimum conditions for early life stages of many of these species. Salmon, sea trout and eel also occur in the site (Balanced Seas Final Recommendations Report, 2011).</p> <p>Both boat and shore angling takes place throughout the rMCZ (Stakmap, 2010). It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site that results from the estuary spawning and nursery area (the system of sand</p>	<div> <div> <p>No change in on-site feature condition or fishing mortality is anticipated and therefore no impact on on-site benefits is expected (see Table 4a). The popular angling area just outside the site in the Outer Thames Estuary may benefit from spill-over effects.</p> <p>The designation may lead to an increase in angling visits to the site, which may benefit the local economy. This increase might arise from a change in anglers' preferred angling locations rather than an increase at a national scale in days spent angling or the number of anglers.</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.</p> </div> <div> <p>change:</p>  <p>Confidence: Moderate</p> </div> </div> <div>Beneficial Impact under Policy Option 2</div>


Table 5b. Recreation	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
<p>banks and channels in the Outer Thames Estuary outside the rMCZ is very popular with boat and charter boat anglers fishing for numerous species including mackerel, dogfish and ray).</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site that results from the potential spawning and nursery area.</p>	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs recommend that the conservation objectives for the Native oyster <i>Ostrea edulis</i> and Native oyster beds be changed from “maintain” to “recover”. If the conservation objectives for the features within this site are achieved, then other features will be maintained at favourable condition while Native oysters and native oyster beds will recover to favourable condition.</p> <p>Achievement of conservation objectives may improve the contribution of Native oysters and Native oyster beds 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, benefiting fish stocks. 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>Anticipated direction of change:</p>  <p>Confidence: Low</p>
<p><b>Diving:</b> Diving is not known to take place in the rMCZ.</p>	Beneficial Impact under Policy Option 1 and Policy Option 2	
	N/A	N/A
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that the features to</p>	Beneficial Impact under Policy Option 1	



Table 5b. Recreation	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
<p>be protected by the rMCZ can contribute to the delivery of recreation and tourism 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 (see Table 1 for details).</p> <p>The Blackwater Estuary is a popular area for birdwatching (marshes and estuary) and seal watching (haul-out and pupping sites on the mudflats). There are viewing platforms and hides in the RSPB nature reserves at Old Hall Marshes in the Blackwater and Wallasea Island Wild Coast Project in the Crouch Estuary (<a href="#">RSPB website</a>). Essex Wildlife Trust owns several nature reserves within the rMCZ: Abbotts Hall Farm on the banks of the Blackwater Estuary; Fingringhoe Wick Nature Reserve on the banks of the Colne Estuary; and Blue House Farm Nature Reserve on the banks of the River Crouch. All reserves are open to the public and contain facilities such as bird hides (<a href="#">Essex Wildlife Trust website</a>).</p> <p>It has not been possible to estimate the value derived from 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. However, if the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by organisations involved with wildlife watching and that would be expected to increase visitation rates 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 wildlife watching trips at the national scale.</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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Moderate</p>
<b>Beneficial Impact under Policy Option 2</b>		
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs recommend that the conservation objectives for the Native oyster <i>Ostrea edulis</i> and Native oyster beds be changed from “maintain” to “recover”. If the conservation objectives for the features within this site are achieved, then other features will be maintained at favourable condition while Native oysters and native oyster beds will recover to favourable condition.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Low</p>


Table 5b. Recreation	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
	<p>An improvement in the condition of site features, in particular Native oysters and native oyster beds, and any associated increase in the 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><b>Other recreation:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>All four estuaries are extremely popular tourist destinations, especially for recreational sailing and coastal walking with numerous harbours, marinas, shopping facilities and coastal paths available for visitors and residents. Sailing clubs offer races and training for all ages (<a href="#">RYA website</a>) with the largest and most popular clubs and marinas situated in Burnham-on-Crouch in the Crouch Estuary; West Mersea and Maldon on the Blackwater; and Brightlingsea near the end of the Colne Estuary (Stakmap, 2010). West Mersea is also a popular tourist destination due to the oyster fishery and associated history of the area (Stakmap, 2010).</p> <p>It has not been possible to estimate the value derived from tourism in the rMCZ.</p>	<b>Beneficial Impact under Policy Option 1</b>	
	<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 tourism are expected. However, if the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by the tourism and leisure industry and that would be expected to increase visitation rates.</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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Moderate</p>
	<b>Beneficial Impact under Policy Option 2</b>	


Table 5b. Recreation	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objective under this option (compared to Policy Option 1).</p> <p>SNCBs recommend that the conservation objectives for the Native oyster <i>Ostrea edulis</i> and Native oyster beds be changed from “maintain” to “recover”. If the conservation objectives for the features within this site are achieved, then other features will be maintained at favourable condition while Native oysters and native oyster beds will recover to favourable condition.</p> <p>West Mersea is a popular tourist destination due to the oyster fishery and associated history of the area (Stakmap, 2010). The protection of the Native oyster and Native oyster beds may support this kind of tourism. The protection of this species also signifies that the historical importance of oyster fishing in the area is being protected, which can be a draw for more tourists. However, it is not clear how other recreational activities may change due to this. There could be a positive impact on these other activities since tourists who come to the area will not only be attracted by the history of the area and its connections to the oyster fishery, but they will also participate in other activities. This increase may represent a redistribution of location preferences, rather than an overall increase in UK tourist visits.</p> <p>Anticipated direction of change:</p>  <p>Confidence: Low</p>

Table 5c. Research and education	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
Baseline	Beneficial impact

Table 5c. Research and education	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
<p><b>Research:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services.</p> <p>Essex Wildlife Trust carries out research throughout the rMCZ including 'rewilding' projects for salt marsh, fish monitoring, and an initiative to develop sustainable management of the native oyster with the Blackwater Oystermen (<a href="#">Essex Wildlife Trust website</a> and Balanced Seas Essex sites meeting, 2011). The University of Colchester undertakes academic research on the estuaries within the rMCZ (Balanced Seas Essex sites meeting, 2011). The RSPB monitors bird populations throughout the rMCZ (<a href="#">RSPB website</a>). There is archaeological interest within the foreshore area and along the banks of each of the estuaries (<a href="#">English Heritage website</a>).</p> <p>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 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>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: High</p>
<p><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of education services.</p> <p>Essex Wildlife Trust provides formal education in the form of field trips to their nature reserves in the rMCZ and as outreach activities within classrooms and school grounds for ages ranging from pre-school to higher education. The estuaries have high numbers of school visits (<a href="#">Essex Wildlife Trust website</a>).</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 additional local (to the rMCZ) provision of education activities (e.g. events, interpretation boards), from which visitors would derive benefit.</p> <p>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 style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

Table 5d. Regulating services	rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
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Table 5d. Regulating services		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries	
Baseline		Beneficial impact under Policy Option 1	
<p><b>Regulation of pollution:</b> the features of the site contribute to water purification (Native oyster) and sequestration of carbon (intertidal rock and Native oyster) (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> the features of the site (intertidal rock and Native oyster) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011)</p> <p><b>Natural hazard protection:</b> the features of the site (Native oyster) contribute to local flood and storm protection (Fletcher and others, 2011).</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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>	
	<p>It has not been possible to estimate the value derived from regulating services associated with the rMCZ.</p>	<p><b>Beneficial Impact under Policy Option 2</b></p> <p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs recommend that the conservation objectives for the Native oyster <i>Ostrea edulis</i> and Native oyster beds be changed from “maintain” to “recover”. If the conservation objectives for the features within this site are achieved, then other features will be maintained at favourable condition while Native oysters and native oyster beds will recover to favourable condition.</p> <p>Native oysters contribute to water purification and local flood and storm protection in the site (Fletcher and others, 2011). If the achievement of conservation objectives result in the increase in the stock of native oysters in the area, then it is likely that there will be an improvement in the ecosystem service. However, the degree of this improvement is currently unknown.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ 3, Blackwater, Crouch, Roach and Colne Estuaries
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 rMCZ and the ecosystem services provided, even if they do not currently benefit from them.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with 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 MPAs. 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, Lowe, Sanghera, &amp; Solandt (2012). Voters in the MCS's 'Your Seas Your Voice' campaign felt that features of the natural environment were strong motivators for reasons why people thought areas within the rMCZ should be protected, with people frequently attaching value to biodiversity and 'spectacular scenery'. The vast majority felt that allowing fish and shellfish recovery was as an important management reason to protect the site. A minority perceived the area to be 'under threat' from 'damaging and extractive activities'.</p> <p>Source: Ranger et al. (2011)</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**rMCZ 6 Medway Estuary****Site area (km<sup>2</sup>): 64.83**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, the draft conservation objective for one feature of this site has been changed from that established by the Regional Projects. This change and its impacts on management and costs are reflected under Policy Option 2.

Table 1. Conservation impacts			rMCZ 6, Medway Estuary	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) is almost entirely intertidal or subtidal mud, a relatively geographically restricted habitat in the region, with small patches of other habitats. Towards the mouth of the estuary, the habitat becomes dominated by subtidal coarse sediments and subtidal sand. The site contains good examples of estuarine rocky habitats, small patches of sheltered muddy gravels (considered to be particularly species diverse here), and peat and clay exposures. It is one of only three locations in the Balanced Seas Project Area where the tentacled lagoon worm occurs. The Medway might be one of the most suitable areas for eel recovery in the future. Nursery grounds for bass, plaice, sole and cod, and skate and smelt occur here. The estuary is also home to salmon, sea trout , and the Thames herring, and contains an important site for seal foraging and a colony of Sandwich tern at Burntwick Island				
Source: Balanced Seas Final Recommendations (2011).				
1b. Baseline condition of MCZ features and impact of the MCZ				
Feature	Area of feature (km2)	No. of occurrences	Baseline	Impact of the MCZ
Broad-scale Habitats				
A1.3 low energy intertidal rock	0.45	-	Favourable condition	Maintain at favourable condition
A2.2 intertidal sand/muddy sand	0.11	-	Favourable condition	Maintain at favourable condition
A2.4 intertidal mixed sediments	0.06	-	Favourable condition	Maintain at favourable condition
A5.1 subtidal coarse sediment	4.10		Favourable condition	Maintain at favourable condition
A5.2 subtidal sand	3.16		Favourable condition	Maintain at favourable condition
A5.3 subtidal mud	19.64		Favourable condition	Maintain at favourable condition
Habitats of Conservation Importance				

Table 1. Conservation impacts			rMCZ 6, Medway Estuary	
Estuarine rocky habitats	0.02		Favourable condition	Maintain at favourable condition
Peat and clay exposures	312.57m <sup>2</sup>		Favourable condition	Maintain at favourable condition
Sheltered muddy gravels		41 records	Favourable condition	Maintain at favourable condition
<b>SNCB advice recommends that the conservation objective for sheltered muddy gravels from “Maintain” to “Recover”; therefore Option 2 uses the conservation objective “Recover” for this feature. .</b>				
<b>Species of Conservation Importance</b>				
Tentacled Lagoon Worm ( <i>Alkmaria romijni</i> )		12 records	Favourable condition	Maintain at favourable condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Tentacled Lagoon Worm ( <i>Alkmaria romijni</i> ), intertidal sand/muddy sand, subtidal mud				

### Site-specific costs arising from the effect of the recommended Marine Conservation Zone on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage		rMCZ 6, Medway Estuary
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b>		
<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> <p>However, restrictions could also be placed upon:</p> <ul style="list-style-type: none"> <li>Archaeological excavation in areas of peat and clay exposures in the site.</li> </ul>		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2	
Several World War II defence aids/structures are recorded in the site (e.g. pillboxes). Wrecked vessels of British, Norwegian, Dutch, Irish, Swedish, Belgian, Danish and German origin have been recorded within the site. One wreck (the HMS <i>Bulwark</i> ) is protected by the Protection of Wrecks Act 1973 by a 200m exclusion zone. Cropmarks, clearance cairns, Roman, Iron Age, Bronze Age and	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	

Table 2a. Archaeological heritage	rMCZ 6, Medway Estuary
<p>Anglo Saxon artefacts have been recorded within the site. There are 3 designated monuments within the site – Hoo Fort (Isle of Grain), Grain Tower and Rochester Bridge (English Heritage, 2012).</p> <p>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)</p>	<p>licence application could be in the region of £500 to £10,000 depending on the size of the MCZ (English Heritage, pers. comm.. 2012). No further impacts on activities related to archaeology are anticipated.</p> <p>If archaeologists respond to restrictions on excavation in areas of peat and clay exposure by undertaking alternative archaeological excavations 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. If archaeological excavations do not take place as a result of this restriction this will prevent interpretation of archaeological evidence from the site, which will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.</p>

Table 2b. Coastal development (excluding ports and harbours)	rMCZ 6, Medway Estuary
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></p> <p>Increase in costs of assessing environmental impacts for future licence applications and costs of mitigation of impacts if required for the proposed Thames Estuary airport</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2
<p>Proposals for the Thames Estuary airport are at an early stage and a number of locations have been suggested. The most recent proposal (the Thames Hub) is for a site that lies within 1km of the rMCZ, and that straddles the land and sea on the Isle of Grain, at the eastern end of the Hoo Peninsula (<a href="http://www.halcrow.com/Thames-Hub/PDF/Thames_Hub_vision.pdf">www.halcrow.com/Thames-Hub/PDF/Thames_Hub_vision.pdf</a>).</p>	<p>Because proposals for the airport are at an early stage it is not known whether additional costs for assessing environmental impacts in future licence applications will be incurred as a result of the rMCZ or whether additional mitigation of impacts on features protected by the MCZ will be required.</p>

Table 2c. National defence	rMCZ 6, Medway Estuary
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<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b> 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. The MOD will also incur costs in revising environmental tools and charts to include MCZs.				
<b>Baseline description of activity</b>		<b>Costs of impact of MCZ on the sector under Policy Option 1 and Policy Option 2</b>		
The MOD is known to make use of the rMCZ for surface explosions.		It is not known whether this rMCZ will impact on the MOD's use of the site. Impacts of rMCZs on national defence are assessed in Annex H10 and N9 (they are not assessed for this site alone).		
<b>Table 2d. Ports, harbours, shipping and disposal sites</b>		<b>rMCZ 6, Medway Estuary</b>		
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b>  <b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for navigational dredging that takes place within 1km of the rMCZ. The Balanced Seas MCZ project is not aware of activities related to ports, harbours and shipping for which additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline.  <b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for disposal of dredged material, navigational dredging and all port and harbour developments within 5 km of the rMCZ. Also, additional costs incurred in updating the Maintenance Dredging Protocol (MDP) that is being prepared by Medway Ports, in order to assess impacts of activities on MCZ features. The Balanced Seas MCZ project is not aware of activities related to ports, harbours and shipping for which additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline.				
<b>Baseline description of activity</b>		<b>Costs of impact of MCZ on the sector under Policy Option 1 and Policy Option 2</b>		
<b>Disposal sites:</b>  There is one disposal site (TH103 Garrison Point) within 1km of the rMCZ. No licence applications were received for this disposal site between 2001 and 2010 but it is not closed to disposal in future (Cefas, pers. comm., 2011).  There is one disposal site (TH103 Garrison Point) within 5km of the		<i>£m/yr</i>	Scenario 1	Scenario 2
		Cost to the operator	0.002	0.004*
		*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		

Table 2d. Ports, harbours, shipping and disposal sites	rMCZ 6, Medway Estuary
<p>rMCZ. No licence applications were received for this disposal site between 2001 and 2010 but it is not closed to disposal in future (Cefas, pers. comm., 2011).</p> <p><b>Navigational dredge areas:</b> There is an extensive network of licensed dredged channels both within and within 1km of this rMCZ associated with the Medway Ports. Medway Ports undertakes maintenance dredging in the approach channel and berths (around Sheerness, Isle of Grain, Lower Halstow). Recreational clubs undertake minor amounts of dredging elsewhere in the estuary (e.g. Chillingham Marina) (Medway Ports, 2012)). It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal</p> <p>Within 5km of the rMCZ there are various maintenance and navigation channels associated with various ports and harbours within this rMCZ. It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal. As these navigational dredge areas will be covered by the MDP being prepared by Medway Ports, it is assumed that the assessment of environmental impact is not changed over the 20 year period of the IA.</p> <p><b>Port development:</b> There are 7 ports and harbours within 5km of the rMCZ, which may undergo development at some point in the future: Sheerness and Chatham (both run by Medway Ports), Thamesport on the Isle of Grain, Queenborough on the Isle of Sheppey, Gillingham harbour (used for leisure only), Kingsnorth (jetty for the power station on the Hoo Peninsula), and Rochester (Ports &amp; Harbours UK, 2012). (This may not represent a full list of all ports and harbours impacted by the site.) No port developments are known to be planned within the 20 year period of the Impact Assessment (IA). Given the importance of the main ports and terminals in the Medway and Swale (which have a combined</p>	<p>costs at a regional level and for the entire suite of sites. Also, this figure assumes that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal (every 3 years). It does not include the cost of incorporating MCZ features in an existing or new MDP. It is likely to over-estimate the cost of Scenario 2 for rMCZs with ports within 5km that have MDPs because of the savings in future costs provided by an MDP. See Annex H for further information</p> <p><b>Scenario 1:</b> Future licence applications for navigational dredging within 1km of this rMCZ 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 (a breakdown of these by activity is provided in Annex N11).</p> <p><b>Scenario 2:</b> Future licence applications for disposal of dredged material, navigational dredging and port or harbour development plans and proposals within 5km of this site 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 (a breakdown of these by activity is provided in Annex N11).</p> <p>Also, additional costs will arise to update the Maintenance Dredging Protocol (MDP) that is currently being prepared by Medway Ports as this will need to consider the potential effects of activities on the features protected by the rMCZ. The anticipated additional cost in the MDP is estimated to be a one-off cost of £8438.</p>

Table 2d. Ports, harbours, shipping and disposal sites	rMCZ 6, Medway Estuary
annual turnover of 12 million tonnes) (Medway Ports, 2012), it is possible that mitigation options may need to be considered in the future.	

Table 2f: Commercial fishing		rMCZ 6, Medway Estuary							
<b>Source of costs of the rMCZ</b>									
<b>Policy Option 1</b>									
No management anticipated, based on the Regional Project draft Conservation Objectives (and therefore no costs are anticipated).									
<b>Policy Option 2</b>									
The change in conservation objective for sheltered muddy gravels from “maintain to “recover” means that management is now needed for this activity in this site. SNCB advice for this site is that it seems likely that main driver for the change in CO is due to sensitivity of this feature to bottom trawling and dredging; therefore it is assumed that there is a lower probability of management for static gears.									
<b>Management scenario 1:</b> No additional management									
<b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls and dredges									
<b>Summary of all fisheries:</b> Estimated annual value of landings from the rMCZ: £1.790m/yr (MCZ Fisheries Model).									
<b>Baseline description of UK commercial fisheries</b>		<b>Costs of impact of rMCZ on UK commercial fisheries</b>							
<b>Bottom trawls:</b> Number of vessels unknown.		Estimated annual value of UK vessel landings affected:							
Estimated total value of landings from the rMCZ: £0.006m/yr (MCZ Fisheries Model).		<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							
No further baseline information is available at this stage as the									



Table 2f: Commercial fishing		rMCZ 6, Medway Estuary							
management scenario resulting from the SNCB advice on the change in conservation objective was received after the Regional Projects had finished.									
<p><b>Dredges:</b> Number of vessels unknown.</p> <p>Estimated total value of landings from the rMCZ: £0.021m/yr (MCZ Fisheries Model).</p> <p>No further baseline information is available at this stage as the management scenario resulting from the SNCB advice on the change in conservation objective was received after the Regional Projects had finished.</p>		<p>Estimated annual value of UK vessel landings affected:</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>0.021</td></tr></table>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.021
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.021							
<p><b>Nets:</b> Vessel numbers not known.</p> <p>Estimated total value of landings from the rMCZ: £0.001m/yr (MCZ Fisheries Model).</p> <p>No further baseline information is available at this stage as the management scenario resulting from the SNCB advice on the change in conservation objective was received after the Regional Projects had finished.</p>		<p>The estimated annual value of UK net landings affected is expected to fall within the following range of scenarios:</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>0.001</td></tr></table> <p>In establishing the draft conservation objectives, the site’s features may have been assessed as having low vulnerability to fishing with nets at current levels and, where this is the case, this activity was not the primary reason for assigning the ‘recover’ conservation objectives. As such, it is anticipated that if additional 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	Value of landings affected	0.000	0.001
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.001							
<p><b>Pots and traps:</b> Vessel numbers not known.</p> <p>Estimated total value of landings from the rMCZ: £0.000m/yr (MCZ Fisheries Model).</p> <p>No further baseline information is available at this stage as the management scenario resulting from the SNCB advice on the change in conservation objective was received after the Regional Projects had finished.</p>		<p>The estimated annual value of UK pot and trap landings affected is expected to fall within the following range of scenarios:</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>0.000</td></tr></table> <p>In establishing the draft conservation objectives, the site’s features may have been assessed as having low vulnerability to fishing with pots and traps at current levels and, where this is the case, this activity was not the primary</p>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.000
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.000							

Table 2f: Commercial fishing		rMCZ 6, Medway Estuary			
		reason for assigning the 'recover' conservation objectives. As such, it is anticipated that if additional 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 on UK commercial fisheries under Policy Option 2					
		Estimated annual value of UK vessel landings and gross value added (GVA) affected:			
		<i>£m/yr</i>	Scenario 1	Scenario 2	Best Estimate
		Value of landings affected	0.000	0.028	0.004
		GVA affected	0.000	0.013	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.			
Baseline description of non-UK fisheries		Costs of impact of rMCZ on non-UK commercial fisheries			
		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 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 6, Medway Estuary
<b>Policy Option 1</b> Cables (interconnectors and telecom cables), Commercial fisheries (bottom trawls, dredges, hooks and lines, mid-water trawls, nets, pots and traps, collection by hand) Flood and coastal erosion risk management (coastal defence) Generation of electricity (power stations on land), Recreation Research and education Shipping Water abstraction, discharge and diffuse pollution*.	

**Policy Option 2**

Cables (interconnectors and telecom cables),  
 Flood and coastal erosion risk management (coastal defence)  
 Generation of electricity (power stations on land),  
 Recreation  
 Research and education  
 Shipping  
 Water abstraction, discharge and diffuse pollution\*.

\*The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>21</sup> ✓ = 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 6, Medway Estuary	
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

<sup>21</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A1.3 Low energy intertidal rock	BSH	✓	✓	✓	None	Maintain	Shares the greatest contribution to the adequacy target – along with the Stour and Orwell Estuaries		
A2.2 Intertidal sand and muddy sand	BSH	✓	✓	✓	None	Maintain			
A2.4 Intertidal mixed sediments	BSH	✓	✓	✓	None	Maintain			
1A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Maintain			
A5.3 Subtidal mud	BSH	✓	✓	✓	None	Maintain			
Estuarine rocky habitats	FOCI Habitat	✓	✓	✓	None	Maintain	This site is one example of four (minimum three and one site is already under MPA designation)		BAP habitat - UK obligation, decline, key species
Peat clay exposures	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat - key species, functional

Annex I2. Site specific *Impact Assessment materials (Option 2)*

									habitat
Sheltered muddy gravels	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Tentacled lagoon worm <i>Alkmaria romijni</i>	FOCI Species	✓	✓	✓	None	Maintain			Listed on Schedule 5 Wildlife and Countryside Act
Site considerations									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * <sup>1</sup>					
Overlaps with existing MPAs				✓					

**Additional comments and site benefits:**

<sup>1</sup> The site offers one of the top three areas for European eel (*Anguilla anguilla*) recovery in the region (Defra 2010d). However, currently there is only a sparse occurrence of this FOCI and therefore was not put as designation (pers comms).

This is a complex and dynamic ecosystem where the mix of fresh and sea waters with tidal movement create changing levels of salinity and nutrient richness that provide a fertile environment for large populations of animals, particularly invertebrates, fish and birds (Medway Swale Estuary Partnership (MSEP) 2011).

## Annex I2. Site specific *Impact Assessment materials (Option 2)*

This site is one of the Key Inshore Biodiversity Areas in the Balanced Seas Region recommended by the South-East England Biodiversity Forum (South East England Biodiversity Forum (SEEBF) 2010).

This site is one of only three locations where the tentacled lagoon Worm (*Alkmaria romijni*) is thought to occur in the region, so it is only meeting the minimum replication target (South East England Biodiversity Forum (SEEBF) 2010).

Nursery grounds for Bass, Herring, Plaice, Sole and Cod (Kent and Essex IFCA 2010).

The site supports migratory species, such as Salmon and Sea Trout (Colclough, Marine fish nursery function in the Medway Estuary. 2010b).

Important Seal foraging site (Balanced Seas RSG 2010).

Important colony of Sandwich Terns forage on the both the intertidal and subtidal areas not currently protected in the SPA.

### 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 6, Medway Estuary
Baseline	Beneficial impact under Policy Option 1	

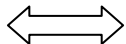

Table 5a. Fish and shellfish for human consumption	rMCZ 6, Medway Estuary	
<p>Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption.</p> <p>Subtidal coarse sediments, sand and mud and intertidal sand, muddy sand and mixed sediments are important for spawning and nursery grounds. These habitats can provide important nursery grounds for juvenile commercial species such as flatfishes and bass (Fletcher and others, 2011).</p> <p>The Medway Estuary is considered to be an important commercial fish nursery area for several species (including Dover sole and bass) and is thought to be an ideal place for future European eel recovery (Balanced Seas Final Recommendations Report, 2011). As such it is likely to help to support potential on-site and off-site fisheries.</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 (see Table 1 for details).</p> <p>A very low level of commercial fishing is conducted within the estuary by the Rochester Oyster and Floating Fisheries (ROFF), a group of part-time fishers with historical rights to fish within the river from the mouth of the Medway to Rochester (Balanced Seas Final Recommendations Report, 2011). Only two commercial licences are held among 18 members and no other vessels are allowed to fish within the estuary; the majority of ROFF members fish as a hobby. Cod, bass, sole and eel are taken. The total value of landings derived from commercial fisheries within this site is estimated £0.028m/yr by the MCZ Fisheries Model.</p> <p>It has not been possible to estimate the value of the off-site benefits that derive from the spawning and nursery area.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No additional management (above that in the baseline situation) of fishing activities is expected. However, maintaining and monitoring the current fishing practices will safeguard the healthy population of commercial fish and ensure no increase in fishing activity occurs or alternative gears are used.</p> <p>No change in feature condition or harvesting of fish and shellfish is anticipated and therefore no impact on on-site or off-site benefits 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.</p>	<p>Anticipated direction of change:</p> <p></p> <p>Confidence: Moderate</p>
	<p><b>Beneficial Impact under Policy Option 2</b></p> <p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for sheltered muddy gravels is changed from “maintain” to “recover”. This means that if the conservation objectives for the features in this area are achieved, sheltered muddy gravels will be recovered to favourable condition, while other features will be maintained at favourable condition. Table 2f shows costs</p>	<p>Anticipated direction of change:</p> <p></p> <p>Confidence: Low</p>

Table 5a. Fish and shellfish for human consumption	rMCZ 6, Medway Estuary
	<p>of potential additional management for commercial fisheries that may be needed due to the change in conservation objective for sheltered muddy gravels.</p> <p>Subtidal coarse sediments, sand and mud and intertidal sand, muddy sand and mixed sediments are important for spawning and nursery grounds. These habitats can provide important nursery grounds for juvenile commercial species such as flatfishes and bass (Fletcher and others, 2011). Additionally, the Medway Estuary is considered to be an important commercial fish nursery area for several species (including Dover sole and bass) and is thought to be an ideal place for future European eel recovery (Balanced Seas Final Recommendations Report, 2011). As such it is likely to help to support potential on-site and off-site fisheries.</p> <p>The achievement of the conservation objectives of the features of this site could improve or maintain their function as spawning and nursery grounds, which could help improve the stock of commercially caught species. This in turn could improve the availability of fish and shellfish for human consumption. However, how this improvement translates into benefits also depend on how the site is managed. If there is no additional management needed, then fishers may be able to take advantage of the improvement in the ecosystem service. On the other hand, if this area becomes closed off to bottom trawls and dredges, then there may be no benefits to bottom trawlers or dredgers, or they will only experience spill over effects in the surrounding areas. The degree of the improvement in this ecosystem service, however, is not only dependent on the status of the habitats. There are other natural and man-made factors which can also affect the status of the stock of commercial fish and</p>



Table 5a. Fish and shellfish for human consumption		rMCZ 6, Medway Estuary
	shellfish.	

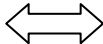
Table 5b. Recreation		rMCZ 6, Medway Estuary
Baseline	Beneficial impact under Policy Option 1	
<p><b>Angling:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of fish and shellfish for human consumption and recreation services.</p> <p>Subtidal coarse sediments, sand and mud and intertidal sand, muddy sand and mixed sediments are important for spawning and nursery grounds. These habitats can provide important nursery grounds for juvenile commercial species such as flatfishes and bass (Fletcher and others, 2011).</p> <p>The Medway Estuary is an important nursery area for fish caught recreationally (including bass) (Balanced Seas Final Recommendations Report, 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</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</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 might arise from a change in anglers' preferred angling locations rather than an increase at a national scale in days spent angling or the number of anglers.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Moderate</p>
	Beneficial Impact under Policy Option 2	


Table 5b. Recreation		rMCZ 6, Medway Estuary
<p>when in favourable condition (see Table 1 for details).</p> <p>Both boat and shore angling for bass, thornback ray, smooth hound, grey mullet, cod and whiting takes place throughout the rMCZ (Stakmap, 2010). Shore angling is popular with local clubs organising competitions on a regular basis. Being close to London, Medway's recreational sea fisheries also attract visitors from further away (Stakmap, 2010). The system of sand banks and channels in the Outer Thames Estuary outside the rMCZ is popular with boat and charter boat anglers fishing for numerous species including mackerel, dogfish and ray and this off-site area may benefit from spill-over effects (Stakmap, 2010). Therefore, the nursery ground for several fish species within the site is likely to help to support potential on-site and off-site fisheries.</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site that results from the intertidal and subtidal habitats.</p>	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for sheltered muddy gravels is changed from “maintain” to “recover”. This means that if the conservation objectives for the features in this area are achieved, sheltered muddy gravels will be recovered to favourable condition, while other features will be maintained at favourable condition.</p> <p>Achievement of the conservation objectives may improve the contribution of sheltered muddy gravels 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, benefiting fish stocks.</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>Anticipated direction of change:</p> <div></div> <p>Confidence: Low</p>
<p><b>Diving:</b> Diving is not known to take place in the rMCZ.</p>	<p><b>Beneficial Impact under Policy Option 1 and Policy Option 2</b></p>	
	<p>N/A</p>	<p>N/A</p>
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that the features to</p>	<p><b>Beneficial Impact under Policy Option 1</b></p>	

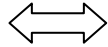

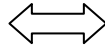
Table 5b. Recreation	rMCZ 6, Medway Estuary	
<p>be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by the features of the site when in favourable condition (see Table 1 for details).</p> <p>The Medway Estuary is popular for wildlife watching as it has an important seal foraging site and also a colony of Sandwich terns at Burntwick Island. Birdwatching is the most popular activity. The RSPB has a reserve with birdwatching facilities in Motney Hill Marshes and Medway Council manages the Riverside Country Park adjacent to the rMCZ in which Horrid Hill is a popular birdwatching point.</p> <p>It has not been possible to estimate the value derived from 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. However, if the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by organisations involved with wildlife watching and that would be expected to increase visitation rates and therefore the value of the ecosystem service. An increase in wildlife watching visits to the site may benefit the local economy. This increase may represent a redistribution of location preferences rather than an overall increase in wildlife watching trips at the national scale. 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.</p>	<p>Anticipated direction of change:</p> <p></p> <p>Confidence: Moderate</p>
	<b>Beneficial Impact under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objective for sheltered muddy gravels is changed from “maintain” to “recover”. This means that if the conservation objectives for the features in this area are achieved, sheltered muddy gravels will be recovered to favourable condition, while other features will be maintained at favourable condition.</p> <p>An improvement in the condition of site features, in particular sheltered muddy gravel habitat, and any associated increase in the abundance and diversity of species that are visible to wildlife</p>	<p>Anticipated direction of change:</p> <p></p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ 6, Medway Estuary
	<p>watchers may improve the quality of wildlife watching in the site and therefore the value of the ecosystem service. The area is an important feeding area for Sandwich terns and the improvement in the habitat of prey species of these birds could improve the status of these prey species. This in turn could improve the population of this bird species, but the degree of this improvement (or if there will be any) in this site is currently unknown.</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>
<b>Other recreation:</b> Fletcher and others (2011) identify that the features to	<b>Beneficial Impact under Policy Option 1 and Policy Option 2</b>

<b>Table 5b. Recreation</b>		<b>rMCZ 6, Medway Estuary</b>
<p>be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The Medway Estuary is a very popular tourist destination especially for recreational sailing, kayaking, canoeing and coastal/estuarine walking. There are footpaths along the banks of the estuary (<a href="#">Medway Council website</a>), and numerous sailing, kayaking and canoeing clubs within the site as well as marinas and docks. Racing events and training for novices are available from many of the clubs (Stakmap, 2010).</p> <p>It has not been possible to estimate the value derived from other recreation 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 tourism are expected. However, if the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by the tourism and leisure industry and that would be expected to increase visitation rates.</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.</p>	<p>Anticipated direction of change:</p> <p></p> <p>Confidence: Moderate</p>

<b>Table 5c. Research and education</b>		<b>rMCZ 6, Medway Estuary</b>
<b>Baseline</b>	<b>Beneficial impact under Policy Option 1 and Policy Option 2</b>	

Table 5c. Research and education		rMCZ 6, Medway Estuary
<p><b>Research:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services.</p> <p>Greening the Gateway Kent and Medway, a partnership of public, private and third sector organisations that works to promote the sustainable regeneration of North Kent and Medway, is currently involved in the Greater Thames Marshes Nature Improvement Area, which involves research into habitat improvement (<a href="#">Greening the Gateway Kent and Medway website</a>). Research is also conducted by Kent County Council in order to inform the Kent Coastal Network initiative (<a href="#">Kent Coastal Network website</a>).</p>	<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>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence:</p> <p>High</p>
<p><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Riverside Country Park, adjacent to the rMCZ, organises events and provides educational facilities within the park which relate to the marine environment (<a href="#">Kent County Council website</a>).</p>	<p>MCZ designation may provide an opportunity to expand the focus of education events into the marine environment.</p> <p>Designation may aid additional local (to the rMCZ) provision of education activities (e.g. events, interpretation boards), from which visitors would derive benefit.</p> <p>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 style="text-align: center;">↑</p> <p>Confidence:</p> <p>Moderate</p>

Table 5d. Regulating services	rMCZ 6, Medway Estuary
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Table 5d. Regulating services		rMCZ 6, Medway Estuary
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> the features of the site contribute to the bioremediation of waste (subtidal sediments) and sequestration of carbon (intertidal rock and subtidal sediments) (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> the features of the site (intertidal rock and sheltered muddy gravels) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p><b>Natural hazard protection:</b> the features of the site, (intertidal sediments) contribute to local flood and storm protection (Fletcher and others, 2011).</p> <p>It has not been possible to estimate the value derived from regulating services associated with 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 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.</p>	<p>Anticipated direction of change:</p> <p></p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ 6, Medway Estuary
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5e. Non-use and option values	rMCZ 6, Medway 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 rMCZ and the ecosystem services provided, even if they do not currently benefit from them.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with 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 MPAs. 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, Lowe, Sanghera, &amp; Solandt (2012). Voters in the MCS's 'Your Seas Your Voice' campaign felt that features of the natural environment were strong motivators for reasons why people thought areas within the rMCZ should be protected, with people frequently attaching value to biodiversity and 'spectacular scenery, bird populations and wildlife.' Regarding non-extractive use value, ease of access and close proximity were considered important as reasons to protect this site. Furthermore, there was a perception that the area is 'under threat'.</p> <p>Source: Ranger et al. (2011)</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>



**rMCZ 7, Thanet Coast**Site area (km<sup>2</sup>): 62.79

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts			rMCZ 7, Thanet Coast	
1a. Ecological description				
<p>The Thanet Coast recommended Marine Conservation Zone (rMCZ) includes the longest continuous stretch of coastal chalk in the UK, with subtidal chalk reefs that extend into the intertidal zone to form chalk cliffs and the second most extensive example of chalk caves in the UK, supporting specialised algal communities. The area is regionally noteworthy for its littoral chalk communities and subtidal chalk platforms. Intertidal blue mussel beds on mixed and sandy sediments (which is an unusual form of intertidal Ross worm reef mixed with blue mussels), and peat and clay exposures are also found here. Another unusual intertidal Ross worm biotope is recorded at Kingsgate within the rMCZ on the shore where sand fringes the chalk reef; this rare biotope is restricted to Kent, and has not been recorded elsewhere in the UK. Two very rare stalked jellyfish species occur here, St John’s jellyfish and the kaleidoscope jellyfish. Algal richness is high, with Whiteness Gap containing unique algal assemblages associated with chalk platforms and caves. The rMCZ is internationally important for wintering birds and the marine life associated with the chalk cliffs, caves, reefs and sandy bays, and nationally important for the geology, the chalk stacks and an unusual chalk arch. The rMCZ provides good foraging grounds for black-legged kittiwake, with thousands present offshore in the winter. The sand banks off the Reculver–Margate coast are also an important feeding site for great cormorant. The site overlaps the Thanet Coast Site of Special Scientific Interest, the Thanet Coast Special Area of Conservation (SAC) and a small section of the southern part of Margate and Long Sands SAC and the Outer Thames Estuary Special Protection Area.</p> <p>Source: Balanced Seas Final Recommendations (2011).</p>				
1b. Baseline condition of MCZ features and impact of the MCZ				
Feature	Area of feature (km2)	No. of occurrences	Baseline	Impact of the MCZ
<b>Broad-scale Habitats</b>				
A3.2 mod energy infralittoral rock	0.25	-	Favourable condition	Maintain at favourable condition
A4.2 mod energy circalittoral rock	8.37	-	Favourable condition	Maintain at favourable condition
A5.1 subtidal coarse sediment	8.74	-	Favourable condition	Maintain at favourable condition
A5.2 subtidal sand	5.61		Favourable condition	Maintain at favourable condition
A5.4 subtidal mixed sediments	13.46		Favourable condition	Maintain at favourable condition
<b>Habitats of Conservation Importance</b>				

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 1. Conservation impacts			rMCZ 7, Thanet Coast	
Blue mussel beds	0.01		Favourable condition	Maintain at favourable condition
Peat and clay exposures	1,319 m <sup>2</sup>		Favourable condition	Maintain at favourable condition
Ross worm ( <i>Sabellaria spinulosa</i> ) reef	2,107 m <sup>2</sup>		Unfavourable condition	Recover to favourable condition
Subtidal chalk	8.85		Favourable condition	Maintain at favourable condition
Subtidal sands and gravels	6.04		Favourable condition	Maintain at favourable condition
Species of Conservation Importance				
St John's Jellyfish ( <i>Lucernariopsis cruxmelitensis</i> )		1 record	Favourable condition	Maintain at favourable condition
Kaleidoscope Jellyfish ( <i>Haliclystus auricula</i> )		1 record	Favourable condition	Maintain at favourable condition
<p><b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>Moderate energy infralittoral rock, moderate energy circalittoral rock, subtidal coarse sediment, subtidal sand, subtidal mixed sediments, Blue mussel beds, Rossworm (<i>Sabellaria spinulosa</i>) reef, Subtidal chalk, Subtidal sands and gravels</p>				

**Site-specific costs arising from the effect of the recommended Marine Conservation Zone on human activities (over 2013 to 2032 inclusive)**

Table 2a: Archaeological heritage		rMCZ 7, Thanet Coast
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></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 recommended Marine Conservation Zone (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> <p>However, restrictions could also be placed upon:</p> <ul style="list-style-type: none"> <li>anchoring in areas of vulnerable MCZ features in the site, including ross worm (<i>Sabellaria spinulosa</i>) reef;</li> <li>archaeological excavation in areas of peat and clay exposures in the site.</li> </ul>		
Baseline description of activity		Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2

Table 2a: Archaeological heritage	rMCZ 7, Thanet Coast
<p>Roman, iron-age, bronze-age and anglo-saxon artefacts, cropmarks and clearance cairns have been recorded here, as well as wrecked vessels of British, Portuguese, Belgian, American, French and Swedish vessels and a World War II German Do17 bomber crash site. Other features adjacent to the rMCZ include Droit House and Stone Pier (English Heritage, 2012).</p> <p>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).</p>	<p>An extra cost would be incurred in the assessment of environmental impacts made in support of 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 depending on the size of the rMCZ (English Heritage, pers. comm., 2012). No further impacts on activities related to archaeology are anticipated.</p> <p>If archaeologists respond to restrictions on excavation in areas of peat and clay exposures, and restrictions on anchoring over areas of <i>Sabellaria spinulosa</i> reef, by undertaking alternative archaeological excavations in another locality, this could result in additional costs to the archaeologists. It is not possible to predict when or how often this may occur, so it is not costed in the Impact Assessment. If archaeological excavations do not take place as a result of these restrictions, this will prevent interpretation of archaeological evidence from the site, which will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.</p>

Table 2b: Commercial fisheries	rMCZ 7, Thanet Coast
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></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. Two scenarios have been employed in the Impact Assessment (IA) for these fisheries in order to reflect this uncertainty: open to certain gear types and closure of the fishery within the site. Should the site be designated, the management that will be required will fall somewhere within this range.</p> <p><b>Management scenario 1:</b> Closure of entire rMCZ to bottom trawls and dredges to protect areas of Ross worm reefs (Statutory Nature Conservation Bodies (SNCB) informed scenario: zoned closure is not possible without additional survey work to confirm distribution because of the uncertainty of the locality of the Ross worm reef).</p>	

Table 2b: Commercial fisheries		rMCZ 7, Thanet Coast							
<b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps to protect Ross worm reefs (SNCB informed scenario).									
<b>Summary of all fisheries:</b> The site is wholly within the 6nm (nautical mile) limit and is fished only by UK vessels. The main commercial fishing fleet using this rMCZ is made up of under 15 metre vessels based at Whitstable (7 in the main trawling fleet, 2 static gear vessels) and Ramsgate port (mostly static gear), and one trawler from Faversham works in this area (information from Fisherman questionnaires). Vessels over 17 m may not operate within 3 nm <b>under a</b> to Kent and Essex IFCA byelaws (Kent & Essex IFCA, 2011). There are also beach-launched vessels at Herne Bay and Margate harbour using static gear in this rMCZ. Some trawlers from Essex use the rMCZ if the weather allows them to travel this far. The main fisheries are static netting and hand potting, closely followed by trawling and oyster dredging (information from Fisherman questionnaires). The vessels fishing the rMCZ mainly comprise small boats, under 10 metres, which tend to fish on ‘day trips’. A variety of static and mobile gears are used according to the target species, and the type of gear used varies with the seasonal fluctuation of each fishery. A number of commercial fishing restrictions are already in existence (listed in Annex E1). More detail on the approach used for the fisheries method is provided in Annexes H7 and N4.									
Estimated annual value of landings from the rMCZ: £0.079m/yr.									
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries under Policy Option 1 and Policy Option 2							
<b>Bottom trawls:</b> Numbers of vessels unknown.		The estimated annual value of UK bottom trawl landings affected is expected to fall within the following range:							
Estimated total value of landings from the rMCZ: £0.019m/yr (MCZ Fisheries Model).		<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.019</td><td>0.019</td></tr></table>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.019	0.019
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.019	0.019							
		A Whitstable vessel owner who was interviewed for the IA questionnaire (August 2011) said that the closure of the entire rMCZ to bottom trawls would affect trawlers, in particular vessels from Whitstable (7 trawlers) and Faversham (1							

Table 2b: Commercial fisheries		rMCZ 7, Thanet Coast							
		trawler), resulting in an approximate 50% loss of earnings. He shared the view that displacement was not a non-viable alternative because all other fishing grounds have existing users and any increased effort within them could lead to conflict, and all available species are already fished using appropriate gears (see Annex J3a for more detail). He thought that trawlers would experience a major loss of revenue, if the entire site was closed, which would lead them to leave the fleet. He said that this would result in an important social cost to the local fishing communities with the loss of 14 jobs if this rMCZ and rMCZ 10 were closed. There would also be a secondary impact because local fish markets, restaurants, fish retailers and activities linked to the fishing fleet, such as repairs, fuel services and gear suppliers, would be affected.							
<b>Dredges:</b> Numbers of vessels unknown.  Estimated total value of landings from the rMCZ: £0.004m/yr (MCZ Fisheries Model).		The estimated annual value of UK dredge landings affected is expected to fall within the following range: <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.004</td><td>0.004</td></tr></table>		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.004	0.004
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.004	0.004							
<b>Nets:</b> Numbers of vessels unknown.  Estimated total value of landings from the rMCZ: £0.043m/yr (MCZ Fisheries Model).		The estimated annual value of UK net landings affected is expected to fall within the following range: <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.043</td></tr></table> <p>In establishing the draft conservation objectives, the site’s features may have been assessed as having low vulnerability to fishing with nets at current levels, and, where this is the case, this activity was not the primary reason for assigning the ‘recover’ conservation objective. As such, it is anticipated that, if additional 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	Value of landings affected	0.000	0.043
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.043							
<b>Pots and traps:</b> Numbers of vessels unknown.  Estimated total value of landings from the rMCZ: £0.012m/yr (MCZ Fisheries Model).		The estimated annual value of UK pot and trap landings affected is expected to fall within the following range:							

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 2b: Commercial fisheries		rMCZ 7, Thanet Coast		
Fisheries Model).	£m/yr	Scenario 1	Scenario 2	
	Value of landings affected	0.000	0.012	
	In establishing the draft conservation objectives, the site's features may have been assessed as having low vulnerability to fishing with pots and traps at current levels, and, where this is the case, this activity was not the primary reason for assigning the 'recover' conservation objective. As such, it is anticipated that, if additional 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 on UK commercial fisheries under Policy Option 1 and Policy Option 2				
	The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:			
	£m/yr	Scenario 1	Scenario 2	Best estimate
	Value of landings affected	0.006	0.079	0.009
	GVA affected	0.003	0.035	0.004
	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.			
Baseline description of non-UK fisheries		Costs of impact of rMCZ on non-UK commercial fisheries		
		None.		

Table 2c: Ports, harbours, shipping and disposal sites	rMCZ 7, Thanet Coast
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b>	
<b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for	

Table 2c: Ports, harbours, shipping and disposal sites		rMCZ 7, Thanet Coast	
disposal of dredged material and navigational dredging that takes place within 1km of the rMCZ. The Balanced Seas regional MCZ project is not aware of activities related to ports, harbours and shipping for which additional mitigation of impacts on features protected by the MCZ that will be needed relative to the mitigation provided in the baseline.			
<b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for disposal of dredged material, navigational dredging and all port and harbour developments within 5 km of the rMCZ. Also, additional costs incurred in including MCZ features in a potential new MDP for Ramsgate. The Balanced Seas regional MCZ project is not aware of activities related to ports, harbours and shipping for which additional mitigation of impacts on features protected by the MCZ that 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 and Policy Option 2	
<b>Disposal sites:</b> There are two sites (TH146 Ramsgate Harbour Site A and TH147 Ramsgate Harbour Site B) within 1km of the rMCZ, which are licensed for disposal of channel dredge material. These are likely to be used by the port of Ramsgate. The average number of licence applications received for both these disposal sites is 0.2 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011)).  There are four disposal sites (Ramsgate Harbour Site A, Pegwell Bay B, Port Ramsgate, Ramsgate Harbour Site B) within 5km of the rMCZ. The average number of licence applications received for all of these disposal sites is 1.2 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011)).  <b>Navigational dredge areas:</b> There is licensed maintenance and navigational dredging within 1km and 5km of this rMCZ associated with Ramsgate port and Margate harbour. It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal. As the navigational dredge areas in the vicinity of Ramsgate would be covered by a potentially new MDP, it is assumed that the assessment of environmental impact is not changed over the 20 year	£m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.004	0.004
	<b>Scenario 1:</b> Future licence applications for disposal of material and for navigational dredging within 1km of this rMCZ 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 (a breakdown of these by activity is provided in Annex N11).  <b>Scenario 2:</b> Future licence applications for disposal of material, navigational dredging and port or harbour development plans and proposals within 5km of this site 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 (a breakdown of these by activity is provided in Annex N11).  Also, additional costs will arise to include MCZ features protected by the rMCZ in a new potential MDP for Ramsgate. The anticipated additional cost in the MDP is estimated to be a one-off cost of £8438.		

Table 2c: Ports, harbours, shipping and disposal sites	rMCZ 7, Thanet Coast
<p>period of the IA.</p> <p><b>Port development:</b> There are 4 ports and harbours within 5km of the rMCZ, which may undergo development at some point in the future: Margate, Broadstairs, Ramsgate and Herne Bay (Ports &amp; Harbours UK, 2012). This may not represent a full list of all ports and harbours impacted by the site. No port developments are known to be planned within the 20 year period of the Impact Assessment (IA).</p>	

Table 2d: Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ 7, Thanet Coast
<p><b>Oil and gas related activities (including carbon capture and storage)</b></p> <p>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 oil and gas related activities are assessed in the Evidence Base, Annex H11 and Annex N10 (they are not assessed for this site alone).</p>	

### Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (over 2012 to 2032 inclusive)

Table 3: Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 7: Thanet Coast
<p>Cables (existing interconnectors and telecom cables),  Commercial fisheries (mid-water trawls, collection by hand)  Flood and coastal erosion risk management (coastal defence)  Recreation  Research and education  Shipping  Water abstraction, discharge and diffuse pollution*.</p>	



\*The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>22</sup> ✓ = 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 7: Thanet Coast	
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
A3.2 Moderate energy infralittoral rock	BSH	✓	✓	✓	None	Maintain	This feature is close to the lower threshold of the adequacy target and only seven sites have been proposed for this feature		

<sup>22</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓	None	Maintain		This is the best regional example of the progression of chalk, from intertidal chalk cliffs to subtidal chalk reefs	
A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Maintain	This BSH is currently only reaching the minimum adequacy target.		
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Maintain			
A5.4 Subtidal mixed sediments	BSH	✓	✓	✓	None	Maintain			
Blue mussel <i>Mytilus edulis</i> beds	FOCI habitat	✓	✓	✓	None	Maintain			BAP and OSPAR
Peat and clay exposures	FOCI Habitat	✓	✓	✓	None	Maintain			BAP
Ross worm <i>Sabellaria spinulosa</i> reefs	FOCI Habitat	✓	✓	✓	None	Recover		Unusual habitat composition because the feature forms a biogenic reef complex with the blue mussel beds	BAP and OSPAR

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Subtidal chalk	FOCI Habitat	✓	✓	✓	None	Maintain		This is the best regional example of the progression of chalk, from intertidal chalk cliffs to subtidal chalk reefs	BAP habitat
Subtidal sand and gravels	FOCI Habitat	✓	✓	✓	None	Maintain			BAP habitat
Stalked jellyfish <i>Haliclystus auricula</i>	FOCI Species	✓ * 1	✓	✓ * 2	None	Maintain	One of two rMCZs for this feature	This feature has a limited distribution in the region.	BAP species
Stalked jellyfish <i>Lucernariopsis cruxmelitensis</i>	FOCI Species	✓ * 1	✓	✓ * 2	None	Maintain	Only rMCZ for this feature	This feature has a limited distribution in the region.	BAP species
<b>Site considerations</b>									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					

## Annex I2. Site specific *Impact Assessment materials (Option 2)*

Areas of Additional Ecological Importance	✓
Overlaps with existing MPAs	✓

### Additional comments and site benefits:

<sup>1</sup> The FOCI species *Haliclystus auricula* (stalked jellyfish) and *Lucernariopsis cruxmelitensis* (stalked jellyfish) features are below the replication target; however the maximum achievable number of replicates for *Haliclystus auricula* has been proposed for designation as it has a limited distribution in the region, so this feature is considered to meet the replication criteria.

<sup>2</sup> Viability for FOCI species *Haliclystus auricula* (stalked jellyfish) and *Lucernariopsis cruxmelitensis* (stalked jellyfish) is dependent on a minimum patch diameter (0.5km and 1km). An area of suitable habitat is present within this rMCZ therefore ticked for viability. New data since recommendations were made indicates that a larger population exists elsewhere within the rMCZ (behind Walpole Bay tidal pool) (Pers. Comms).

There is scientific value in this site because it is well studied with good data (Tittley 2002, English Nature 2001, Natural England 2007).

This is the best example in the region of the progression of chalk cliffs to intertidal chalk reefs to subtidal chalk reefs (Tittley, Spurrier, et al. 1998).

Site has unusual habitat composition because *Sabellaria spinulosa* forms a biogenic reef complex with the blue mussel beds (South East England Biodiversity Forum (SEEBF) 2010).

Walpole Bay tidal pool would potentially make a more suitable area for a reference site for the stalked jellyfish FOCI (*Haliclystus auricula* and *Lucernariopsis cruxmelitensis*), although there still will not be any viable BSH.

### 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 7, Thanet Coast
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p>Fletcher and others (2011) 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.</p> <p>Subtidal coarse sediments, sand and mud are important for spawning and nursery grounds. These habitats can provide important nursery grounds for juvenile commercial species such as flatfishes and bass. (Fletcher and others, 2011). Circalittoral and infralittoral rock are important locations for commercial inshore fishing activity, particularly crab and lobster (Expert opinion in 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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>A relatively high level of commercial fishing is conducted within the subtidal areas of the site. A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p> <p>It has not been possible to estimate the value of the off-site benefits that derive from the spawning and nursery area.</p>	<p>If the conservation objectives of the features are achieved, one of the features (<i>Sabellaria</i> reefs) will recover to favourable condition. The rest will be maintained in favourable condition.</p> <p>New management of fishing activities is expected (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>As most of the commercial species targeted by fishers in this area are mobile fish and crustaceans, 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>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ 7, Thanet Coast
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Angling:</b> Fletcher and others (2011) 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</p>	<p>If the conservation objectives of the features are achieved, some of the features (<i>Sabellaria</i> reefs) will recover to favourable condition. Others will be maintained in favourable</p>	<p>Anticipated direction of change:</p>


Table 5b. Recreation	rMCZ 7, Thanet Coast	
<p>recreation services.</p> <p>Subtidal coarse sediments, sand and mud are important for spawning and nursery grounds. These habitats can provide important nursery grounds for juvenile commercial species such as flatfishes and bass (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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details)..</p> <p>The Thanet Coast has very high biodiversity which attracts fish caught recreationally (including whiting and thornback ray) (Balanced Seas Final Recommendations Report, 2011).</p> <p>Both boat and shore angling for bass, thornback ray, smooth hound, grey mullet, cod and whiting takes place throughout the rMCZ. Shore angling is popular and local clubs organise competitions on a regular basis (StakMap, 2010). Being close to London, the Thanet Coast also attracts visitors from further away (<a href="#">Thanet Coast Project website</a>). The system of sand banks and channels in the Outer Thames Estuary outside the rMCZ is popular with boat and charter boat anglers fishing for numerous species including mackerel, dogfish and ray and this off-site area may benefit from spill-over effects (StakMap, 2010). Therefore, the nursery ground for several fish species within the site is likely to help to support potential on-site and off-site fisheries.</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site that results from the intertidal and subtidal habitats.</p>	<p>condition.</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 might arise from a change in anglers' preferred angling locations rather than an increase at a national scale in days spent angling or the number of anglers</p>	 <p>Confidence: Low</p>
<p><b>Diving:</b> Fletcher and others (2011) identify that the features to be</p>	<p>If the conservation objectives of the features are achieved, one</p>	<p>Anticipated</p>



Table 5b. Recreation	rMCZ 7, Thanet Coast	
<p>protected by the rMCZ can contribute to the delivery of recreation services.</p> <p>Diving is very limited within the rMCZ as waters are turbid with sediment and dissolved chalk. However, some diving occurs in the far east of the site in Dumpton Gap near Ramsgate and Botany Bay near Margate (Natural England, 2007). It has not been possible to estimate the value derived from diving in the rMCZ.</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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p>	<p>feature will recover to favourable condition and rest will be maintained in favourable condition.</p> <p>If the rMCZ results in an increase in biodiversity, which may include recovery of fragile and slow-growing species as a result of reduced pressure from mobile fishing gears, this is expected to increase the value of dive visits derived by divers of 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 represent a redistribution of dive location preferences rather than an overall increase in diving.</p>	<p>direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Low</p>
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>Mussel beds are an important food source for birds (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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details)..</p> <p>The Thanet Coast is popular for wildlife watching as it is internationally important for wintering birds and for the marine life associated with the chalk cliffs, caves, reefs and sandy bays. It is also nationally important for the geology, the chalk stacks and arch, and coastal plants (<a href="#">Thanet Coast Project website</a>). Birdwatching is a popular activity within the rMCZ, particularly at Foreness Point on the North Kent cliffs (<a href="#">RSPB website</a>). However, the whole coast is accessible, and with the subtidal and</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>The recovery of <i>Sabellaria</i> to favourable condition may improve their functioning as support for fish, bird and marine mammal populations, potentially benefitting wildlife watching within the rMCZ. 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>Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ 7, Thanet Coast
<p>intertidal chalk ledges providing rock-pooling opportunities on the foreshore, wildlife watchers can be found throughout the rMCZ (<a href="#">Thanet Coast Project website</a>).</p> <p>It has not been possible to estimate the value derived from wildlife watching in the rMCZ.</p>	<p>degradation from pressures caused by human activities.</p>	
<p><b>Other recreation:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The Thanet Coast is a very popular tourist destination, especially for recreational sailing, kayaking, canoeing, personal watercraft, water skiing and coastal walking. There are numerous sailing, kayaking and canoeing clubs within the site as well as marinas, docks and launch sites. Racing events take place and training for novices is available from many of the clubs (StakMap, 2010). Coastal walking routes include the Viking Trail and easy access to the shore throughout the rMCZ (Natural England 2007).</p> <p>It has not been possible to estimate the value derived from other recreation in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, some of the features will recover to favourable condition. Others will be maintained in favourable condition.</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.</p> <p>If the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by the tourism and leisure industry and that would be expected to increase visitation rates.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5c. Research and education		rMCZ 7, Thanet Coast
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services.</p> <p>North East Kent Scientific Coastal Advisory Group has a membership consisting of scientists and governmental and non-governmental bodies who co-ordinate research in the area to inform management and public</p>	<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>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p>



Table 5c. Research and education		rMCZ 7, Thanet Coast
<p>awareness activities. The Thanet Coast Project, which manages the North East Kent European Marine Sites, also initiates research projects in the area (<a href="#">Thanet Coast Project website</a>). Kent Wildlife Trust regularly conducts sea-floor and sea-shore surveys through Seasearch and Shoresearch. Research is also conducted by Kent County Council in order to inform the Kent Coastal Network initiative (<a href="#">Kent Coastal Network website</a>).</p>		<p>Confidence:</p> <p>High</p>
<p><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The Thanet Coast Project organises regular community events for educational purposes to raise awareness of the biodiversity in the area and to connect the local communities to the coast. There are also outreach and stakeholder activities, with a strong focus on education (<a href="#">Thanet Coast Project website</a>).</p>	<p>MCZ designation may provide an opportunity to expand the focus of education events into the marine environment.</p> <p>Designation may aid additional local (to the rMCZ) provision of education activities (e.g. events, interpretation boards), from which visitors would derive benefit.</p> <p>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 7, Thanet Coast
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> the features of the site contribute to the bioremediation of waste (subtidal sediments), water purification (Blue Mussels beds and <i>Sabellaria</i>) and sequestration of carbon (subtidal sands and gravels, Blue Mussels beds and <i>Sabellaria</i>) (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> the features (<i>Sabellaria</i> and Blue Mussel beds) of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p><b>Natural hazard protection:</b> the features of the site (<i>Sabellaria</i> and Blue Mussel beds and infralittoral rock), contribute to local flood and storm</p>	<p>If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (<i>Sabellaria</i> reefs) recovered to favourable condition.</p> <p>Recovery of the <i>Sabellaria</i> reefs and a potential reduction in the use of bottom towed fishing gear may increase the site's benthic biodiversity and biomass, improving the regulating capacity its habitats.</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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence:</p>

Table 5d. Regulating services		rMCZ 7, Thanet Coast
protection (Fletcher and others, 2011).		Low
It has not been possible to estimate the value derived from regulating services associated with the rMCZ.		

Table 5e. Non-use and option values		rMCZ 7, Thanet Coast
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 rMCZ and the ecosystem services provided, even if they do not currently benefit from them.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with 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 MPAs. 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, Lowe, Sanghera, &amp; Solandt, 2012). Voters in the MCS's 'Your Seas Your Voice' campaign felt that features of the natural environment were strong motivators for reasons why people thought areas within the rMCZ should be protected, with people frequently attaching value to biodiversity, particularly the seal populations resident here. Also, feelings of emotional attachment to the site were expressed as well. Regarding non-extractive use value, ease of access and the proximity of the site were considered important as reasons to protect this site. Furthermore, there was a perception that the area is 'under threat' from 'damaging activities and extraction'. (Ranger et al. (2011)</p> <p>Furthermore, the existing protected North East Kent Marine Sites (NEKMS) has provided a focal point for stakeholders, increasing</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ 7, Thanet Coast
	awareness of marine life and the environment and providing a platform from which to coordinate events which have created social, economic, health and wellbeing benefits to the community. A recent study has shown that the existing marine protected area in Thanet has promoted environmental and leisure use within the community and helped to support local infrastructure, groups and tourism within the area (Tony Child email, Thanet Coast Project, 2011).	

**rMCZ 11.4, Folkestone Pomerania****Site area (km<sup>2</sup>): 33.71**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, draft conservation objectives for some features have been changed from those established by the Regional Projects. These changes and their impacts on management and costs are reflected under Policy Option 2.

Table 1. Conservation impacts			rMCZ 11.4, Folkestone Pomerania	
1a. Ecological description				
<p>This recommended Marine Conservation Zone (rMCZ) was identified as it contains one of only two examples of fragile sponge and anthozoan communities on subtidal rocky habitats in the region, and one of only two examples of honeycomb worm reefs. It is also particularly notable for the large depressions in the sea bed that drop from around 22 metres to 30 metres. The top edges of the depressions are exposed rock ledges with outcropping greensand, providing an unusually hard and complex subtidal reef habitat, and a flat or gently sloping boulder-strewn platform, supporting a rich attached fauna of sponges, anemones, sea squirts, hydroids and bryozoans, and providing holes and crevices for mobile species such as crab and squat lobster and fish. The slopes of the depressions are relatively steep, the sides and bases being of boulders and mixed sediment, also supporting a rich variety of species. Elsewhere in the rMCZ there are boulder fields covered with both attached and mobile animals and colonies of the slow-growing Ross coral, whose delicate colonies provide further habitat structure for an assemblage of other species. The site supports dense Ross worm reefs on muddy sediment which are very unusual as they contain many of the animals associated with both Ross worm reef and offshore mud and bivalve mollusc communities. This mix of biotopes is not known to occur elsewhere in the Balanced Seas Project Area.</p> <p>Source: Balanced Seas Final Recommendations (2011).</p>				
1b. Baseline condition of MCZ features and impact of the MCZ				
Feature	Area of feature	No. of	Baseline	Impact

Table 1. Conservation impacts			rMCZ 11.4, Folkestone Pomerania	
	(km2)	occurrences		
<b>Broad-scale habitats</b>				
A4.2 Moderate energy circalittoral rock	1.6	-	Unfavourable condition	Recover to favourable condition
A5.1 Subtidal coarse sediments	24.58	-	Favourable condition	Maintain at favourable condition
A5.2 Subtidal sand	7.12	-	Unfavourable condition	Recover to favourable condition
<b>SNCBs' advice recommends the conservation objective for Subtidal sand is changed from "Recover" to "Maintain at favourable condition"; therefore Option 2 uses the conservation objective "Maintain" for this feature.</b>				
<b>Habitats of Conservation Importance</b>				
Blue mussel beds	312.57 m <sup>2</sup>		Unfavourable condition	Recover to favourable condition
<b>SNCBs' advice recommends the conservation objective for Blue mussel beds is changed from "Recover" to "Maintain at favourable condition"; therefore Option 2 uses the conservation objective "Maintain" for this feature.</b>				
Fragile sponge & anthozoan communities	-	3 records	Unfavourable condition	Recover to favourable condition
Honeycomb worm ( <i>Sabellaria alveolata</i> ) reef	0.01	-	Unfavourable condition	Recover to favourable condition
Rossworm ( <i>Sabellaria spinulosa</i> ) reef	0.07	-	Unfavourable condition	Recover to favourable condition
Subtidal sands and gravels (modeled)	29.15	-	Unfavourable condition	Recover to favourable condition
<b>SNCBs' advice recommends the conservation objective for Subtidal sands and gravels is changed from "Recover" to "Maintain at favourable condition".</b>				
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Subtidal coarse sediment, Subtidal sand, Rossworm ( <i>Sabellaria spinulosa</i> ) reef, Fragile sponge & anthozoan communities, Honeycomb worm ( <i>Sabellaria alveolata</i> ) reef				

### Site-specific costs arising from the effect of the recommended Marine Conservation Zone on human activities (over 2013 to 2032 inclusive)

Table 2a. Archaeological heritage		rMCZ 11.4, Folkestone Pomerania
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b>		
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.		
However, restrictions could be placed on anchoring in areas of vulnerable MCZ features in the site, including <i>Sabellaria</i> reef.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy	

Table 2a. Archaeological heritage	rMCZ 11.4, Folkestone Pomerania
	Option 2
<p>Named and dated wrecks of British, German, French, Dutch, Danish and Norwegian origin have been recorded in the site, along with several unidentified wrecks. A World War I German submarine has also been recorded in the site, as well as World War II aircraft of British and German origin (English Heritage, 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 depending on the size of the MCZ (English Heritage, pers. comm., 2012). No further impacts on activities related to archaeology are anticipated.</p> <p>If archaeologists respond to restrictions on anchoring over areas of <i>Sabellaria</i> reef by undertaking alternative archaeological excavations 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. If archaeological excavations do not take place as a result of this restriction, this will prevent interpretation of archaeological evidence from the site which will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.</p>

Table 2b. Commercial fisheries	rMCZ 11.4, Folkestone Pomerania
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></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. Therefore, two scenarios have been employed in the Impact Assessment for these fisheries to reflect this uncertainty. Should the site be designated, the management that will be required will fall somewhere within this range.</p> <p><b>Management scenario 1:</b> Closure of the entire rMCZ to bottom trawls and dredges to protect areas of Ross worm <i>Sabellaria spinulosa</i> reef and honeycomb worm <i>Sabellaria alveolata</i> reef (Statutory Nature Conservation Bodies (SNCB) informed scenario).</p> <p><b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps to protect areas of moderate energy circalittoral rock, blue mussel <i>Mytilus edulis</i> beds, fragile sponge and anthozoan communities, Ross worm <i>Sabellaria spinulosa</i> reef and honeycomb worm <i>Sabellaria alveolata</i> reef (SNCB informed scenario).</p>	

Table 2b. Commercial fisheries		rMCZ 11.4, Folkestone Pomerania							
*NB. The Regional Stakeholder Group agreed to the recommendation for this rMCZ with closure to bottom trawls only.									
Folkestone Pomerania recommended MCZ went through several iterations during the Regional Project process. The site has support and agreement from the local fishing fleet to cease trawling as long as trawling in Hythe Bay rMCZ is not restricted beyond a zoned management proposal put forward by them. The conservation objective was changed to maintain based on the Fisheries Standardisation work showing low levels of exposure and this was also supported by stakeholder feedback about the absence of trawling in this area.									
<b>Summary of all fisheries:</b> This site is wholly within the 6nm limit and is fished only by UK vessels. The main commercial fishing fleets operating in the site are based in Folkestone and Dungeness. The most important fisheries for vessels below 15 metres are static nets, scallop dredging, bottom trawling and potting (MCZ Fisheries Model). Several larger UK trawlers/beam trawlers have historical 'grandfather rights' to fish between 3nm (nautical miles) and 6nm and have a different quota allocation to the smaller local trawlers. There are also 3 Brixham vessels with grandfather rights to this area, but these are likely to gradually cease operating. The site is small and activity is limited due to the geography and adjacent shipping channels. The main activities are netting for bass, and potting for lobsters and crabs. Effort in a trap fishery for cuttlefish is increasing because cuttlefish are a non-quota species. A number of commercial fishing restrictions are already in existence (listed in Annex E1). More detail on the approach used for the fisheries method is provided at Annexes H7 and N4.									
Estimated annual value of landings from the rMCZ: £0.062 m/yr.									
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries under Policy Option 1 and Policy Option 2							
<b>Bottom trawls:</b> Number of vessels unknown.  Estimated total value of landings from the rMCZ: £0.013m/yr (MCZ Fisheries Model).		The estimated annual value of UK bottom trawl landings affected is expected to fall within the following range of scenarios: <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.013</td><td>0.013</td></tr></table> If the rMCZ were to be designated, the local trawlers have said that they would no longer trawl within the rMCZ provided that the zoning and management areas that they proposed for rMCZ 26 are adhered to (assuming that rMCZ 26 is also designated). As this management scenario would involve closure to trawling only (and not dredging) it does not directly equate to either Scenario 1 or 2.		£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.013	0.013
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.013	0.013							
<b>Dredges:</b> Number of vessels unknown.  Estimated total value of landings from the rMCZ: £0.008m/yr (MCZ Fisheries Model).		The estimated annual value of UK dredge landings affected is expected to fall within the following range of scenarios:							

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 2b. Commercial fisheries		rMCZ 11.4, Folkestone Pomerania		
Fisheries Model).	£m/yr	Scenario 1	Scenario 2	
	Value of landings affected	0.008	0.008	
<b>Nets:</b> Number of vessels unknown.  Estimated total value of landings from the rMCZ: £0.034m/yr (MCZ Fisheries Model).	The estimated annual value of UK net landings affected is expected to fall within the following range of scenarios:			
	£m/yr	Scenario 1	Scenario 2	
	Value of landings affected	0.000	0.034	
<b>Pots and traps:</b> Number of vessels unknown.  Estimated total value of landings from the rMCZ: £0.006m/yr (MCZ Fisheries Model).	The estimated annual value of UK pot and trap landings affected is expected to fall within the following range of scenarios:			
	£m/yr	Scenario 1	Scenario 2	
	Value of landings affected	0.000	0.006	
Total direct impact on UK commercial fisheries under Policy Option 1 and Policy Option 2				
	The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:			
	£m/yr	Scenario 1	Scenario 2	Best estimate
	Value of landings affected	0.005	0.061	0.010
	GVA affected	0.002	0.027	0.005
	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 overestimate for this site.			
Baseline description of non-UK fisheries		Costs of impact of rMCZ on non-UK commercial fisheries		
		None.		

<b>Table 2c: Other impacts that are assessed for the suite of MCZs under Policy Option 1 and Policy Option 2 and not for this site alone</b>	<b>rMCZ 11.4, Folkestone Pomerania</b>
<b><i>Oil and gas related activities (including carbon capture and storage)</i></b>	
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 oil and gas related activities are assessed in the Evidence Base, Annex H11 and Annex N10 (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)**

<b>Table 3. Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ 11.4, Folkestone Pomerania</b>
Commercial fisheries (mid-water trawls) Disposal sites (licensed disposal at two sites (DV013 East Wear Bay and DV020 Sandgate Bell) within 5km of the rMCZ for which there are no anticipated licence applications) Recreation Shipping Water abstraction, discharge and diffuse pollution*.	

\*The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by Natural England, pers. comm., 2010).

**Contribution to Ecological Network Guidance**

<b>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<sup>23</sup></b>	<b>rMCZ 11.4, Folkestone Pomerania</b>

<sup>23</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs



Annex I2. Site specific *Impact Assessment materials (Option 2)*

<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>									
ENG Feature	Represent- ativity	Replicatio n	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative consideration s at regional MCZ level	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓	None	Recover			
A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Recover			
Blue mussel <i>Mytilus edulis</i> beds	FOCI Habitat	✓	✓	✓	None	Recover			OSPAR habitat and BAP habitat - UK obligation, decline, functional habitat

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Ross worm <i>Sabellaria spinulosa</i> reefs	FOCI Habitat	✓	✓	✓	None	Recover		This site supports unusual associated biotopes on mud habitats not seen elsewhere in the region.	
Fragile sponge and anthozoan communities on subtidal rocky habitat	FOCI Habitat	✓	✓	✓	None	Recover	This is one of two regional occurrences of this feature	This is one of two regional occurrences of this feature	BAP habitat - UK obligation, decline, key species, functional habitat
Honeycomb worm <i>Sabellaria alveolata</i> reefs	FOCI Habitat	✓	✓	✓ * 1	None	Recover	This is one of two regional occurrences of this feature	This is one of two regional occurrences of this feature	BAP
Subtidal sands and gravels	FOCI Habitat	✓	✓	✓	None	Recover			
Site considerations									

## Annex I2. Site specific *Impact Assessment materials (Option 2)*

Connectivity	✓
Geological/Geomorphological features of interest	None
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓ * 2, 3, 4
Overlaps with existing MPAs	X

### Additional comments and site benefits:

<sup>1</sup> This site is only one of two examples of the FOCI habitat *Sabellaria alveolata* reefs in the region, both within MCZs so the replication criteria is met. This site is also thought to be the best area to confidently capture biogenic reef in the region, and it is felt the best area of biogenic reef has been captured in the site.

<sup>2</sup> There are features which occur in this site, that have not been proposed for designation as it was felt that this site is not a suitable place to include Native Oysters (*Ostrea edulis*), European eels (*Anguilla anguilla*), smelt (*Osmerus eperlanus*) and undulate ray (*Raja undulata*) for designation.

<sup>3</sup> The site contains regionally rare features identified by the Wildlife Trusts such as Ross coral (*Pentapora foliacea*) and the sea anemone (*Diadumene cincta*) (Balanced Seas 2011a).

<sup>4</sup> The site supports mobile species such as crabs and squat lobsters as well as providing refuge for fish (Balanced Seas 2011a).

This site contains large depressions in the seabed, falling from around 22m-30m. At the top edges of these large depressions are exposed rock ledges, and a flat or gently sloping boulder-strewn platform, supporting a rich attached assemblage of fauna such as sponges, anemones, sea squirts, hydroids and bryozoans. These rich communities represent a very rare example of the Habitat FOCI 'fragile sponges and anthozoan communities on subtidal rocky habitats' (Balanced Seas 2011a).

Dense biogenic reefs of Ross worms on underlying muddy sediments are present in this site. These reefs are extremely unusual as they contain many of the animals associated with both the *Sabellaria* reef biotope, offshore mud biotopes with bivalve molluscs and *Sabellaria alveolata* reef biotope, offshore mud biotopes. This mix of biotopes is not known to occur elsewhere in the Balanced Seas area.

Foraging grounds for various Tern and Gull spp. (Balanced Seas 2010b). Nursery and spawning grounds for fish such as Sole, Cod, Mackerel and Herring (Balanced Seas 2011c).

### 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 11.4, Folkestone Pomerania	
Baseline	Beneficial impact under Policy Option 1		
<p>Fletcher and others (2011) 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.</p> <p>Subtidal coarse sediments, and subtidal sands and gravels, are important for spawning and nursery grounds. These habitats can provide important nursery grounds for juvenile commercial species such as flatfishes and bass and support internationally important fish and shellfish fisheries. Moderate energy infralittoral rock may support commercial inshore fishing activity, particularly crab and lobster. The subtidal blue mussel beds provide habitat for fish and shellfish (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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>The Folkestone and Dungeness commercial fishing fleets are active in this rMCZ, with static nets, scallop dredgers, bottom trawlers and potting; there are also a small number of larger trawlers/beam trawlers with ‘grandfather rights’. The main activities are netting and lining for bass, potting for lobster and crab, and a growing cuttlefish trap fishery. A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p> <p>It has not been possible to estimate the value of the off-site benefits that derive from spawning and nursery areas.</p>	<p>If the conservation objectives of the features are achieved, some of the features will recover to favourable condition. One (A5.1 subtidal coarse sediments) will be maintained in favourable condition.</p> <p>New management of fishing activities is expected (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>As most of the commercial species targeted by fishers in this area are mobile fish and shellfish, 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>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.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>	
	Beneficial Impact under Policy Option 2		
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objectives for Blue Mussel beds, subtidal sand and subtidal sand and gravels be changed from “recover” to “maintain at favourable condition”. If the conservation objectives of this site</p>	<p>Anticipated direction of change:</p> <p>Uncertain</p>	

Table 5a. Fish and shellfish for human consumption		rMCZ 11.4, Folkestone Pomerania
	<p>are achieved, then some features will be maintained at favourable condition, while the others will be recovered to favourable condition. In the Impact Assessment, is assumed that there will be additional management required for the site, and this additional management are listed in Table 2b. However, it is envisaged that a Gentlemen's agreement to stop all trawling within this site will be implemented instead.</p> <p>If the conservation objectives are achieved, then there may be improvements in habitats such as subtidal sands and gravels which are important spawning and nursery grounds and blue mussel beds which are important habitats for several commercial species. This can improve in the provision of fish and shellfish for human consumption. The actual benefits that are derived from this improvement will depend on the management that is implemented since a ban of trawling within the area could result in a loss in benefits for some fishers although there could be positive spill over effects in the surrounding area.</p>	Confidence: Low

Table 5b. Recreation		rMCZ 11.4, Folkestone Pomerania
Baseline	Beneficial impact under Policy Option 1	
<p><b>Angling:</b> Fletcher and others (2011) 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>Circalittoral rock supports a diverse array of species and it is a potential location for angling due to the high concentration of animal life (Expert opinion in 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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p>	<p>If the conservation objectives of the features are achieved, some of the features, including the circalittoral rock, will be recovered to favourable condition. Others will be maintained in favourable condition.</p> <p>The recovery of the circalittoral rock to favourable condition may improve its functioning as a support for a diverse array of species and increase their biodiversity in general, potentially benefiting angling activities within and outside the rMCZ (see Table 4a).</p> <p>As no additional management of angling is expected fishers will be able to benefit from any on-site beneficial effects. If the rMCZ results in an increase in the size and diversity of species caught</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ 11.4, Folkestone Pomerania	
<p>The rMCZ is a popular area for private boat angling and charter boat fishing. It is mainly used for wreck fishing (StakMap, 2010). Due to the complex habitats within the site and the generally high biodiversity, it is likely to help to support potential on-site and off-site fisheries.</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site that potentially results from the high biodiversity of the site.</p>	<p>then this is expected to increase the value derived by anglers, both on and off-site</p> <p>Designation of this site 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 angling.</p>	
	<b>Beneficial Impacts under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this Option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objectives for Blue Mussel beds, subtidal sand and subtidal sand and gravels be changed from “recover” to “maintain at favourable condition”. If the conservation objectives of this site are achieved, then some features will be maintained at favourable condition, while the others will be recovered to favourable condition.</p> <p>If the conservation objectives are achieved, then there may be improvements in habitats such as subtidal sands and gravels which are important spawning and nursery grounds and blue mussel beds which are important habitats for species targeted by anglers. This could improve the stock of the species that are caught by anglers. Additionally, the protection of these habitats can support biodiversity in the area; therefore further supporting potential on-site and off-site fisheries.</p> <p>It is not clear if there will be an increase in angling visits over and above what is already expected due to the designation of the site.</p>	<p>Anticipated direction of change:</p> <p>Uncertain</p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ 11.4, Folkestone Pomerania	
<p><b>Diving:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation services. Circalittoral rock supports a diverse array of species and is a potential location for SCUBA diving due to the high concentration of animal life (Expert opinion in Fletcher and others, 2011).</p> <p>The rMCZ is a popular wreck and general diving spot (South Kent site meeting, 2011).</p>	<b>Beneficial Impact under Policy Option 1 and Policy Option 2</b>	
	<p>Designation of this site might lead to an increase in diving trips, as a result of publicity about the marine biodiversity and rare species found in the site. If populations of species such as fragile sponge and anthozoan communities increase, this could lead to an improved quality of experience for divers, which may benefit the local economy. This increase may represent a redistribution of location preferences rather than an overall increase in diving trips at the national scale.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that 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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>Circalittoral rock supports a diverse array of species and mussel beds are important habitat for foraging birds (Fletcher and others, 2011). Habitat complexity and the generally high biodiversity of the site support foraging birds and marine mammals that may frequent the site. Birdwatching within this site may still be possible along the cliff walk within rMCZ 11.2 due to the elevated height providing a vantage point.</p> <p>The rMCZ is offshore and will only be visited by charter vessels conducting wildlife watching trips out of Dover and Folkestone. Wildlife watching cruises between Dover and France are run by DFDS Seaways in association with ORCA (<a href="#">DFDS Seaways website</a>)</p>	<b>Beneficial Impact under Policy Option 1</b>	
	<p>If the conservation objectives of the features are achieved, some of the features, including the circalittoral rock, will be recovered to favourable condition. Others will be maintained in favourable condition.</p> <p>The recovery of the circalittoral rock to favourable condition may improve its functioning as a support for a diverse array of species and increase the biodiversity of the site in general. 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>Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ 11.4, Folkestone Pomerania	
It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	from pressures caused by human activities.	
	<b>Beneficial Impact under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1).</p> <p>SNCBs advise that the conservation objectives for Blue Mussel beds, subtidal sand and subtidal sand and gravels be changed from “recover” to “maintain at favourable condition”. If the conservation objectives of this site are achieved, then some features will be maintained at favourable condition, while the others will be recovered to favourable condition.</p> <p>The achievement of the conservation objectives of this site could support the species that frequent the site to feed due to a potential increase in their foodsource. This in turn will improve the quality of the wildlife watching experience. However, it is not clear if this improvement will be over and above what is expected from the designation of the site.</p>	<p>Anticipated direction of change:</p> <p>Unclear</p> <p>Confidence: Low</p>
<p><b>Other recreation:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>Other recreational pursuits are not known to occur specifically within the rMCZ; however, recreational traffic will pass through in transit to other destinations or on its way to Dover or Folkestone Harbour (StakMap, 2010).</p> <p>It has not been possible to estimate the value derived from tourism in the rMCZ.</p>	<b>Beneficial Impact under Policy Option 1 and Policy Option 2</b>	
	<p>Since this rMCZ lies offshore, it is unlikely that any additional benefits would be accrued from other recreational activities as a result of designation</p> <p>.</p> <p>.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>



Table 5c. Research and education		rMCZ 11.4, Folkestone Pomerania
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> Fletcher and others (2011) 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 formal research activities are currently carried out in the rMCZ. However, ferries crossing the Channel may be used by marine mammal observers whose data contribute to national databases.</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 style="text-align: center;">↑</p> <p>Confidence: High</p>
<p><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity occurs in the rMCZ.</p>	<p>As the rMCZ is approximately 6km 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 pMCZ 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 style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ 11.4, Folkestone Pomerania
Baseline	Beneficial impact under Policy Option 1	


Table 5d. Regulating services	rMCZ 11.4, Folkestone Pomerania	
<p><b>Regulation of pollution:</b> the features of the site contribute to the bioremediation of waste (subtidal sediments), water filtration (Blue Mussel beds, <i>Sabellaria</i>) and sequestration of carbon (Blue Mussel beds, <i>Sabellaria</i>, subtidal sediments) (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> the features of the site (intertidal rock, Blue Mussel beds and <i>Sabellaria</i>) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p><b>Natural hazard protection:</b> as the site is offshore, its features are not thought to contribute to the delivery of this service (Fletcher and others, 2011).</p> <p>It has not been possible to estimate the value derived from regulating services associated with the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (circalittoral rock, subtidal sand, subtidal sands &amp; gravels, fragile sponge &amp; anthozoan communities, <i>Sabellaria</i> and blue mussel beds) recovered to favourable condition.</p> <p>Recovery of the circalittoral rock, Blue Mussel beds and <i>Sabellaria</i> Reefs and a potential reduction in the use of bottom towed fishing gear may increase the site's benthic biodiversity and biomass, improving the regulating capacity its habitats.</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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Low</p>
	<b>Beneficial Impacts under Policy Option 2</b>	
	<p>The possible impacts differ under Policy Option 2 as changes have been made to the draft conservation objectives under this option (compared to Policy Option 1)</p> <p>SNCBs advise that the conservation objectives for Blue Mussel beds, subtidal sand and subtidal sand and gravels be changed from “recover” to “maintain at favourable condition”. If the conservation objectives of this site are achieved, then some features will be maintained at favourable condition, while the others will be recovered to favourable condition.</p> <p>Several of the features that had a change in conservation objectives contribute towards this ecosystem service. For example, Blue mussel beds help to sequester carbon and contribute to the resilience and continued generation of marine ecosystems (Fletcher and others, 2011). The achievement of conservation objectives of these features means that there could</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">Unclear</p> <p>Confidence: Low</p>

Table 5d. Regulating services		rMCZ 11.4, Folkestone Pomerania
	be an improvement in the provision of this ecosystem service. However, the degree of this improvement and whether there will be an improvement on top of what is expected from designating the site is not clear.	

Table 5e. Non-use and option values		rMCZ 11.4, Folkestone Pomerania
Baseline	Beneficial impact	
<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 rMCZ and the ecosystem services provided, even if they do not currently benefit from them.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with 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 MPAs. 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 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>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**rMCZ 13.2, Beachy Head West****Site area (km<sup>2</sup>): 25.58**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts			rMCZ 13.2, Beachy Head West	
1a. Ecological description				
<p>This recommended Marine Conservation Zone (rMCZ) would protect some of the best examples of littoral chalk communities and subtidal chalk gullies and ledges found in the Balanced Seas project area. The abundant wildlife that these features support includes extensive blue mussel beds mixed with native oysters, and large sea squirt beds. Populations of both long- and short-snouted seahorse occur here, and European eel elvers migrate along the coastline into the estuaries. The sea-bed habitats include moderate energy intertidal rock, intertidal coarse sediment and mud, subtidal mud, and sand and mixed sediment. The rMCZ provides good foraging areas for black-legged kittiwake, common tern and Sandwich tern. Near Birling Gap, notable algal communities are found on the chalk foreshore reef (identified as an Important Plant Area). The calcite rings, 2 metres in diameter, on the chalk at Hope Gap are noteworthy geological features. Running along the base of the Seven Sisters cliffs, the site covers part of the Seven Sisters Voluntary Marine Conservation Area, borders the South Downs National Park and partially overlaps the Seaford to Beachy Head Site of Special Scientific Interest (SSSI) and the Brighton to Newhaven Cliffs SSSI.</p> <p>Source: Balanced Seas Final Recommendations (2011).</p>				
1b. Baseline condition of MCZ features and impact of the MCZ				
Feature	Area of feature (km2)	No. of occurrences	Baseline	Impact
<b>Broad-scale habitats</b>				
A1.2 Moderate energy intertidal rock	0.02	-	Favourable condition	Maintain at favourable condition
A2.1 Intertidal coarse sediment	733.92 m <sup>2</sup>		Favourable condition	Maintain at favourable condition
A5.2 Subtidal Sand	8.1		Favourable condition	Maintain at favourable condition
A5.3 Subtidal mud of which	1.97		Favourable condition	Maintain at favourable condition
A5.4 Subtidal mixed sediments of which	5.03	-	Favourable condition	Maintain at favourable condition
<b>Habitats of Conservation Importance</b>				
Blue mussel beds	1,954 m <sup>2</sup>	-	Favourable condition	Maintain at favourable condition
Littoral chalk communities	1.03		Unfavourable condition	Recover to favourable condition

Table 1. Conservation impacts			rMCZ 13.2, Beachy Head West	
Subtidal chalk	0.09	-	Favourable condition	Maintain at favourable condition
<i>Species of Conservation Importance</i>				
Native Oyster ( <i>Ostrea edulis</i> )	-	10 records	Favourable condition	Maintain at favourable condition
Short snouted seahorse ( <i>Hippocampus hippocampus</i> )	-	2 records	Favourable condition	Maintain at favourable condition
Long snouted seahorse ( <i>Hippocampus hippocampus</i> )	-	1 record	Favourable condition	Maintain at favourable condition
European Eel ( <i>Anguilla Anguilla</i> )	-	N/A	Favourable condition	Maintain at favourable condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Litoral chalk communities, infralittoral sandy mud, infralittoral rock and thin sandy sediment, infralittoral muddy sand, Native oyster, Short snouted seahorse.				

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

Table 2a. Archaeological heritage		rMCZ 13.2, Beachy Head West
<i>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</i>		
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 and Policy Option 2	
<p>Several World War II defence aids/structures are recorded in the site, e.g. a watch tower, anti-tank trap and pillboxes. Artefacts of Roman, Iron Age, Palaeolithic, Bronze Age, Neolithic and Mesolithic origin have been found within the site. Vessel wrecks of British, Dutch, Swedish, German, Norwegian, Spanish, American, French and Prussian origin have been recorded in the site, as well as a Viking vessel dated to 896. There is evidence of an Iron Age or Roman settlement within the site (English Heritage, pers. comm., 2012).</p> <p>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</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 depending on the size of the MCZ (English Heritage, pers. comm., 2012). No further impacts on activities related to archaeology are anticipated.</p>	

Table 2a. Archaeological heritage	rMCZ 13.2, Beachy Head West
Protection Plan (theme 3A1.2).	

Table 2b. Commercial fisheries	rMCZ 13.2, Beachy Head West
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></p> <p>The Joint Nature Conservation Committee (JNCC) and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gear will be required for certain features protected by this rMCZ. Therefore, two scenarios have been employed in the Impact Assessment (IA) for these fisheries to reflect this uncertainty. Should the site be designated, the management that will be required will fall somewhere within this range.</p> <p><b>Management scenario 1:</b> No additional management (Statutory Nature Conservation Bodies (SNCB) informed scenario).</p> <p><b>Management scenario 2:</b> Closure of entire site to bottom trawls and dredges to protect littoral chalk communities and 50% reduction in activity of lines, nets, pots and traps (SNCB informed scenario).</p> <p>Though the conservation objective of recover for littoral chalk communities was identified in the vulnerability assessment for pressures caused specifically by anchoring of recreational vessels, for the purpose of the IA it is assumed that additional restrictions on fisheries will also be required for this feature because of the conservation objective of recover (the assumption is based on the advice provided by Natural England and JNCC on fisheries management scenarios in the fisheries technical paper).</p>	
<p><b>Summary of all fisheries:</b> The site is within the 6nm (nautical mile) limit. It covers a narrow (0.5nm wide) strip along the coastline which broadly corresponds with the area within which trawlers are excluded under a Sussex Inland Fisheries and Conservation Authority (IFCA) byelaw. Scallop and oyster dredging are also prohibited throughout the site under existing byelaws. Trawling and dredging therefore do not occur although the resolution of the MCZ Fisheries Model is such that it suggests that these gear types are used (see below).. This area is heavily fished with static gear (pots and nets). More detail on the approach used is provided in Annexes H7 and N4.</p> <p>Estimated annual value of landings from the rMCZ: £0.112m/yr.</p>	
Baseline description of UK commercial fisheries	Costs of impact of rMCZ on UK commercial fisheries under Policy Option 1 and Policy Option 2
<p><b>Bottom trawls:</b> Number of vessels unknown</p> <p>Estimated total value of landings from the rMCZ: £0.030m/yr (MCZ</p>	<p>The estimated annual value of UK bottom trawl landings affected is expected to fall within the following range of scenarios:</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 2b. Commercial fisheries		rMCZ 13.2, Beachy Head West	
Fisheries Model).  This is likely to be an overestimate due to the resolution of the Fisheries Model as the site is located within 3nm and most of the site is closed to trawling under an existing byelaw.	£m/yr	Scenario 1	Scenario 2
	Value of landings affected	0.000	0.030
	In establishing the draft conservation objectives, the site's features may have been assessed as having low vulnerability to fishing with bottom trawls at current levels and, where this is the case, this activity was not the primary reason for assigning the recover conservation objectives. As such, it is anticipated that if additional 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.  Furthermore, The value of this impact is likely to be overestimated as a Sussex IFCA byelaw restricts trawling within part of this site (for more detail see Annex E1).		
<b>Dredges</b> Number of vessels unknown.  Estimated total value of landings from the pMCZ: £0.003m/yr.  This is an overestimate due to the resolution of the MCZ Fisheries Model as the site is located within 3nm and is thus closed to dredging under an existing byelaw. However, since this figure is part of the estimated total value of landings for the site, it is included here.	£million/yr	Scenario 1	Scenario 2
	Value of landings affected	0.000	0.003
	The estimated annual value of UK dredge landings affected is expected to fall within the following range of scenarios:  In establishing the draft conservation objectives, the site's features may have been assessed as having low vulnerability to fishing with dredges at current levels and, where this is the case, this activity was not the primary reason for assigning the recover conservation objectives. As such, it is anticipated that if additional 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.  Furthermore, the value of this impact is likely to be overestimated as a Sussex IFCA byelaw restricts dredging within this site (for more detail see Annex E1).		
<b>Hooks and lines:</b> Number of vessels unknownEstimated total value of	The estimated annual value of UK hook and line landings affected is		

Table 2b. Commercial fisheries		rMCZ 13.2, Beachy Head West							
landings from the rMCZ: £0.001/yr (MCZ Fisheries Model).	expected to fall within the following range of scenarios:								
	<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.001</td></tr></table>	£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.001	In establishing the draft conservation objectives, the site's features may have been assessed as having low vulnerability to fishing with hooks and lines at current levels and, where this is the case, this activity was not the primary reason for assigning the recover conservation objectives. As such, it is anticipated that if additional 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.	
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.001							
<b>Nets:</b> Number of vessels unknown.  Estimated total value of landings from the rMCZ: £0.024m/yr (MCZ Fisheries Model).	The estimated annual value of UK net landings affected is expected to fall within the following range of scenarios:								
	<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>0.024</td></tr></table>	£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.024	In establishing the draft conservation objectives, the site's features may have been assessed as having low vulnerability to fishing with nets at current levels and, where this is the case, this activity was not the primary reason for assigning the recover conservation objectives. As such, it is anticipated that if additional 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.	
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.024							
<b>Pots and traps:</b> Number of vessels unknown  Estimated total value of landings from the rMCZ: £0.014m/yr (MCZ Fisheries Model).	The estimated annual value of UK pot and trap landings affected is expected to fall within the following range of scenarios:								
	<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>0.014</td></tr></table>	£m/yr	Scenario 1	Scenario 2	Value of landings affected	0.000	0.014	In establishing the draft conservation objectives, the site's features may have been assessed as having low vulnerability to fishing with pots and traps at current levels and, where this is the case, this activity was not the primary	
£m/yr	Scenario 1	Scenario 2							
Value of landings affected	0.000	0.014							



Table 2b. Commercial fisheries		rMCZ 13.2, Beachy Head West		
		reason for assigning the recover conservation objectives. As such, it is anticipated that if additional 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.		
<b>Total direct impact on UK commercial fisheries under Policy Option 1 and Policy Option 2</b>				
		The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:		
		<i>£m/yr</i>	Scenario 1	Scenario 2
		Value of landings affected	0.000	0.070
		GVA affected	0.000	0.031
		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 overestimate for this site.		
<b>Baseline description of non-UK fisheries</b>		<b>Costs of impact of rMCZ on non-UK commercial fisheries</b>		
		None.		

Table 2c. Flood and coastal erosion risk management (coastal defence)	rMCZ 13.2, Beachy Head West
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b>	
<b>Management scenario 1:</b> no impact on operations arises. This is because material from the re-nourishment is not found to be impacting on achieving the conservation objective of the rMCZ features.	
<b>Management scenario 2:</b> Additional monitoring to establish whether the beach recharge is impacting on the MCZ features. If it is found to be having an impact, it is anticipated that additional costs would be incurred.	
<b>Management scenarios 1 and 2:</b> Increase in costs of assessing environmental impacts for future licence applications for maintenance work for the coastal defence scheme..	

Table 2c. Flood and coastal erosion risk management (coastal defence)		rMCZ 13.2, Beachy Head West
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2	
<p>At Seaford a Hold The Line policy is applied through shingle recharge and beach reprofiling. The shingle is likely to impact high intertidal rock, moderate energy intertidal rock, intertidal coarse sediment, intertidal mixed sediment, littoral chalk communities and blue mussel <i>Mytilus edulis</i> beds through abrasion or siltation resulting in smothering of the features. If it is found to be having an impact, this could arise from imported shingle that is part of the flood and coastal erosion risk management scheme or shingle that is part of natural coastal processes. It is also possible that damage may occur through anchoring or vessel drafts contacting the feature during the process – monitoring will need to take account of this.</p> <p>In Seaford 300 properties are at risk and the scheme is currently maintained on the basis of the chance of one flood event in 100 years; this is estimated to increase to one flood event every 75 years in 2 years and will continue to increase rapidly if the current beach maintenance activities cease (Natural England and Environment Agency Flood and Coastal Erosion Risk Management Workshop for the Balanced Seas Project Area, 17 November 2011).</p> <p>The Environment Agency business case determined that open beach shingle management was the most cost effective, environmentally sensitive and sustainable method of maintaining the current level of protection. Other options included utilising a groyne field or T-neck rock groynes.</p>	<p><b>Scenario 1:</b> No cost through impacts on operations, as the rMCZ is assumed to have no impact on the beach re-nourishment project.</p> <p><b>Scenario 2:</b> To establish whether the shingle recharge and reprofiling is impacting on the MCZ features, additional monitoring will be required as part of the recharge scheme to identify how long pebbles supplied through the shingle recharge and reprofiling remain above mean high water and where they travel. This can be done using a shingle tracer (placing a Global Positioning System (GPS) chip in a number of pebbles and tracking the process). This would be a one-off cost for both sites (rMCZs 13.1 and 13.2) and is discussed in Table 2c above in the assessment for rMCZ 13.1.</p> <p><b>Scenarios 1 and 2:</b> 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 0.5–1 day of additional work, in most cases, 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 2d. Ports, harbours, shipping and disposal sites	rMCZ 13.2, Beachy Head West
Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2	

Table 2d. Ports, harbours, shipping and disposal sites		rMCZ 13.2, Beachy Head West							
<p><b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future license applications. This applies to future license applications for disposal of dredged material, navigational dredging and known specific plans or proposals for port and harbour developments within 1km of the rMCZ. It is anticipated that additional mitigation of impacts on features protected by the MCZ will be needed for port developments or port-related activities relative to the mitigation provided in the baseline.</p> <p><b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future license applications. This applies to future license applications for disposal of dredged material, navigational dredging and all port and harbour developments within 5 km of the rMCZ. Also, additional costs incurred in including MCZ features in a potential new MDP for Newhaven. It is anticipated that additional mitigation of impacts on features protected by the MCZ will be needed for port developments or port-related activities 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 and Policy Option 2							
<p><b>Disposal sites:</b> There are 2 sites (WI010 Newhaven and WI020 Brighton/Rottingdean) within 1km of the rMCZ which are licensed for disposal of channel dredge material. These are likely to be used by Brighton Marina. The average number of licence applications received for all of these disposal sites is 1.4 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011)).</p> <p>There are two sites (WI010 Newhaven and WI020 Brighton/Rottingdean) within 5km of the rMCZ which are licensed for disposal of channel dredge material likely to be used by Brighton Marina, Newhaven and Sovereign Harbour. The average number of licence applications received for all of these disposal sites is 1.4 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011)).</p> <p><b>Navigational dredge areas:</b> It is probable that there is licensed navigational dredging within 1km of this rMCZ associated with Brighton Marina and Newhaven Port Authority. It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal.</p> <p>There is licensed navigational dredging in the River Ouse within 5km of this</p>	<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Cost to the operator</td><td>0.012</td><td>0.015</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Cost to the operator	0.012	0.015
	£m/yr	Scenario 1	Scenario 2						
	Cost to the operator	0.012	0.015						
<p><b>Scenario 1:</b> Future licence applications for disposal of material, navigational dredging and port or harbour development plans or proposals within 1km of this rMCZ 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 (a breakdown of these by activity is provided in Annex N11).</p> <p>Sufficient information is not available to identify whether any additional mitigation of impacts on features protected by the MCZ will be needed for proposed future port and harbour developments relative to the mitigation provided in the baseline. Unknown potentially significant costs of mitigation could arise.</p> <p><b>Scenario 2:</b> Future licence applications for disposal of material, navigational dredging and known port or harbourdevelopment plans or proposals within 5km of this rMCZ 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 (a breakdown these by activity is provided in Annex N11).</p>									

Table 2d. Ports, harbours, shipping and disposal sites	rMCZ 13.2, Beachy Head West
<p>rMCZ associated with Brighton Marina and Newhaven Port Authority. It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon MCZ features is undertaken for each licence renewal. As this navigational dredge areas will be covered by a potential new MDP for Newhaven, it is assumed that the assessment of environmental impact is not changed over the 20 year period of the IA.</p> <p><b>Port development:</b> There are 3 ports and harbours within 5km of the rMCZ which may undergo development at some point in the future: Eastbourne, Newhaven and Brighton (Ports &amp; Harbours UK, 2012). This may not represent a full list of all ports and harbours impacted by the site.</p> <p>Newhaven Port is within 1km of the rMCZ and has a planned regeneration project to develop its port, marinas and leisure facilities (Natural England, pers. comm., 2012). The five key strategic objectives are to maintain the Newhaven–Dieppe ferry route, invest in clean technology and renewable energy, increase international trade, continue to develop the fishing and leisure marine sectors, and enhance the natural marine environment by establishing a public access conservation area on port land (Newhaven Port, 2012).</p>	<p>Also, additional costs will be incurred to include MCZ features protected by the rMCZ in a new potential MDP to consider the potential effects of activities on the features protected by the rMCZ. The anticipated additional cost in the potential new MDP is estimated to be a one-off cost of £8438.</p> <p>Sufficient information is not available to identify what additional mitigation of impacts on features protected by the MCZ will be needed for proposed future port and harbour developments relative to the mitigation provided in the baseline. Unknown potentially significant costs of mitigation could arise.</p>

Table 2e. Recreational anchoring	rMCZ 13.2, Beachy Head West
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></p> <p>Creation of a no-anchoring zone (except in emergency circumstances) over littoral chalk communities.</p>	
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2
<p>Littoral chalk communities occur all along the coast of this rMCZ between Beachy Head Point and Brighton Marina. Local Group members (Balanced Seas East Sussex Sites Meeting Report, July 2011) said that it is unlikely that experienced mariners would try to anchor in chalk as it is</p>	<p>Given that there is probably very little anchoring over littoral chalk communities, the creation of no-anchoring zones where these features occur is not expected to have a significant impact on recreational vessel users. No costs are expected.</p>

Table 2e. Recreational anchoring	rMCZ 13.2, Beachy Head West
<p>very hard to do so; anyone doing this would be either new to seafaring or in an emergency situation. Anchoring in the area is thus largely limited to Cuckmere Haven and Seaford Bay where there is no chalk.</p> <p>Beachy Head is a popular spot for recreational boating due to its dramatic scenery of chalk cliffs, and also for angling. Ten yacht clubs (StakMap 2010), 13 sea angling clubs (StakMap, 2010; <a href="#">Angling Trust Website</a>), and 37 charter vessels (for divers and anglers) use the rMCZ (StakMap, 2010). Higher levels of angling occur in the extreme eastern part of the rMCZ around Beachy Head and to the east of the mouth of the River Cuckmere. Vessels may anchor anywhere (due to the nature of angling) within the rMCZ depending on the weather but are unlikely to anchor over chalk due to the unsuitability of chalk for anchoring. No interviewees confirmed exact anchoring locations (StakMap, 2010).</p> <p>There are already a number of byelaws along this stretch of coast that restrict anchoring (e.g. designated swimming areas) and local stakeholders would like to see management of anchoring rationalised and brought together (Balanced Seas East Sussex Sites Meeting Report, July, 2011).</p>	

Table 2f: Other impacts that are assessed for the suite of MCZs under Policy Option 1 and Policy Option 2 and not for this site alone	rMCZ 13.2, Beachy Head West
<p><b><i>Oil and gas related activities (including carbon capture and storage)</i></b></p> <p>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 oil and gas related activities are assessed in the Evidence Base, Annex H11 and Annex N10 (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)

<b>Table 3. Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ 13.2, Beachy Head West</b>
Cables (existing interconnectors and telecom cables) Commercial fisheries (collection by hand, mid-water trawls) Recreation (except for the activities listed above in table 2) Research and education Shipping Water abstraction, discharge and diffuse pollution*.	

\*The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>24</sup>								rMCZ 13.2 Beachy Head West	
✓ = 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- activity	Replicatio n	Adequac y	Viability	Gaps or shortfalls in relation to ENG minimum	Recommended conservation objective	Quantitative considerations at regional MCZ level	Ecological Importance at regional	Ecological Importance at wider

<sup>24</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

					guidelines			MCZ level	scale
A1.2 Moderate energy intertidal rock	BSH	✓	✓	✓	None	Maintain	This feature overlaps and is fully protected within an existing MPA.		
A2.1 Intertidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
A5.2 Subtidal sand * 1	BSH	✓	✓	X	Not viable	Maintain			
A5.3 Subtidal mud * 1	BSH	✓	✓	X	Not viable	Maintain			
A5.4 Subtidal mixed sediment * 1	BSH	✓	✓	X	Not viable	Maintain			
Blue mussel <i>Mytilus edulis</i> beds	FOCI Habitat	✓	✓	✓	None	Maintain			OSPAR and BAP habitat – UK obligation, decline, functional habitat
Littoral chalk communities	FOCI Habitat	✓	✓	✓	None	Recover		This feature is considered to be one of the best examples in the region	BAP and OSPAR habitat

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Subtidal Chalk	FOCI Habitat	✓	X	X	Not viable	Maintain		This feature is considered to be one of the best examples in the region	BAP habitat
Long-snouted seahorse <i>Hippocampus guttulatus</i>	FOCI Species	X	X	✓	Replication target not met	Maintain	This site is one of two rMCZs for this feature	This feature is not protected within existing MPAs	Internationally threatened, BAP and OSPAR species. Listed on Schedule 5 of the Wildlife and Countryside Act
Short-snouted seahorse <i>Hippocampus hippocampus</i>	FOCI Species	✓	✓	✓ * 1	None	Maintain		This feature is not protected within existing MPAs	Internationally threatened, BAP and OSPAR species. Listed on Schedule 5 of the Wildlife and Countryside Act
Native oyster <i>Ostrea edulis</i>	FOCI Species	✓	✓	✓	None	Maintain		This feature is not protected within existing MPAs	BAP and OSPAR species



Annex I2. Site specific *Impact Assessment materials (Option 2)*

European eel <i>Anguilla anguilla</i>	FOCI Mobile Species	✓	✓	N/A	None	Maintain			OSPAR and BAP species - Internationa l responsibilit y and moderate decline in the UK
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Annex I2. Site specific *Impact Assessment materials (Option 2)*

Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	✓ * <sup>2</sup>
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓ * <sup>3</sup>
Overlaps with existing MPAs	✓ * <sup>4</sup>

**Additional comments and site benefits:**

<sup>1</sup> This is one of only four viable sites for short-snouted seahorse (*Hippocampus hippocampus*).

<sup>2</sup> Natural geological features, such as peat exposures and calcite rings, six feet in diameter on the chalk reef, which are a unique feature.

<sup>3</sup> Large areas of sea squirts (Molgula) beds, and FOCI habitat Ross coral (*Sabellaria spinulosa*), and very unusual claystone reef (South-east features (Browning 2002)) within site. Good foraging area for black-legged kittiwake, common tern and Sandwich terns (Balanced Seas 2011a). *Sabellaria spinulosa* reefs occur within the site but are not considered to be a good example (for protection). Subtidal sands and gravels habitats occur within the site, but they are not a priority for protection. FOCI mobile species undulate rays (*Raja undulata*) are noted to occur in this site but it is not a prime area.

<sup>4</sup> Overlaps with Seven Sister Voluntary Marine Conservation Area.

There is confidence (though low confidence for *H.guttulatus*), that both populations of seahorse occur in this site (Seeley, Lear, et al. 2010a, Seeley, Higgs, et al. 2010b).

The chalk foreshore reef is associated with notable algal communities that have been identified as an Important Plant Area (Brodie, et al. 2007).

The rMCZ is within one of the Key Inshore Biodiversity Areas in the Balanced Seas Region recommended as an MCZ by the South-East England Biodiversity Forum (South East England Biodiversity Forum (SEEBF) 2010).

Sevens Sister was one of the recommendations put forward by the Marine Conservation Society as part of their 'Your Seas Your Voice Campaign (Marine Conservation Society (MCS) 2011).

There is scientific value in this site because it is well studied with good data (Browning 2002, Seven Sisters Voluntary Marine Conservation Area (VCMA) Working Group 1987, South East England Biodiversity Forum (SEEBF) 2010).

#### Table 5. 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 13.2, Beachy Head West
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p>Fletcher and others (2011) 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.</p> <p>Intertidal rock habitats are important sources of larval plankton upon which commercially important fish species feed, including mussels and larval fish of plaice and mackerel. Intertidal coarse sediment provides a scavenging area for fish which supports commercial fisheries. Subtidal mud and subtidal mixed sediments are important for spawning and nursery grounds. These habitats can provide important nursery grounds for juvenile commercial species such as flatfishes and bass. Moderate</p>	<p>If the conservation objectives of the features are achieved, some of the features will recover to favourable condition. The rest will be maintained in favourable condition.</p> <p>New management of fishing activities is expected (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>As most of the commercial species targeted by fishers in this area are crustaceans, it is unclear whether the scale of habitat recovered and the magnitude of reduced (on-site) harvesting will</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 13.2, Beachy Head West
<p>energy and low energy infralittoral rock are important locations for commercial inshore fishing activity, particularly crab and lobster. Blue mussel beds provide habitat for shellfish and fish which are exploited by the fishing industry (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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>The site is heavily fished with static gear (pots and nets) targeting lobster and crab, but no mobile gear is used. A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p>	<p>be enough to have any significant positive impact on commercial stocks.</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.</p>


Table 5b. Recreation	rMCZ 13.2, Beachy Head West
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2
<p><b>Angling:</b> Fletcher and others (2011) 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>Subtidal sand and mixed sediments are important for spawning and nursery grounds. These habitats can provide important nursery grounds for juvenile commercial species such as flatfishes and bass (Fletcher and others, 2011) which are also fished recreationally.</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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>The rMCZ is a relatively popular area for shore angling and private boat angling throughout. Due to the complex habitats within the site and the</p>	<p>If the conservation objectives of the features are achieved, some of the features, including the subtidal mixed sediments and subtidal sand, will be recovered to favourable condition. Others will be maintained in favourable condition.</p> <p>The recovery of the subtidal mixed sediments and subtidal sand to favourable condition may improve its functioning as a nursery area, potentially benefiting angling activities within and outside the rMCZ (see Table 4a).</p> <p>As no additional management of angling is expected fishers will be able to benefit from any on-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, both on and off-site</p> <p>Designation of this site may lead to an increase in angling</p> <p>Anticipated direction of change:</p>  <p>Confidence: Low</p>

Table 5b. Recreation	rMCZ 13.2, Beachy Head West	
<p>generally high biodiversity, it is likely to help to support potential on-site and off-site fisheries.</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site that results from the estuary spawning and nursery area.</p>	<p>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 angling.</p>	
<p><b>Diving:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation services.</p> <p>The rMCZ is mostly intertidal so there is little diving within it but there may be some diving in subtidal areas of the site and one shore diving spot is popular near to the western arm of Newhaven Harbour (<a href="#">British Sub-Aqua Club website forum</a>).</p>	<p>Designation of this site might lead to an increase in diving trips, as a result of publicity about the marine biodiversity and rare species found in the site. If populations of species such as seahorses and Ross coral increase, this could lead to an improved quality of experience for divers, which may benefit the local economy. This increase may represent a redistribution of location preferences rather than an overall increase in diving trips at the national scale.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that 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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>Mussel beds are important habitat for foraging birds (Fletcher and others, 2011). Habitat complexity in the subtidal chalk and the subsequently high biodiversity of the site support foraging birds and marine mammals that may frequent the site.</p> <p>Birdwatching is possible throughout the site along the cliffs and the shore. The site lies within the Seven Sisters Voluntary Marine Conservation Area and borders the South Downs National Park (Balanced Seas Final Recommendations, 2011), and is a popular wildlife</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>The recovery of the subtidal mixed sediments and subtidal sand and blue mussel beds to favourable condition may improve its functioning as a nursery area for a diverse array of species and increase the biodiversity of the site in general. 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</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ 13.2, Beachy Head West
<p>watching destination both on land and via charter vessels conducting wildlife watching trips out of Eastbourne, Brighton and Newhaven (StakMap, 2010). Beachy Head cliffs provide an excellent vantage point for watching seabirds throughout the rMCZ (<a href="#">Sussex Wildlife Trust website</a>).</p> <p>It has not been possible to estimate the value derived from wildlife watching in the rMCZ.</p>	<p>watching visits and/or a redistribution of location preferences.</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.</p>	
<p><b>Other recreation:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>Coastal walking in the accessible parts of the site and along the cliff tops alongside the site is very popular, as well as coastal swimming (<a href="#">Saturday Walkers' Club website</a>).</p> <p>Other recreational pursuits are not known to occur specifically within the rMCZ; however, recreational traffic will pass through in transit to other destinations or on a scenic route past the iconic cliffs (StakMap, 2010).</p> <p>It has not been possible to estimate the value derived from tourism 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>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.</p> <p>If the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by the tourism and leisure industry and that would be expected to increase visitation rates.</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5c. Research and education		rMCZ 13.2, Beachy Head West
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services.</p> <p>Sussex Wildlife Trust undertakes sea-floor surveys through Seasearch, and is collaborating with the Sussex Inshore Fisheries and Conservation Authority on research to improve the health of the marine environment (<a href="http://www.sussexwildlifetrust.org.uk/livingseas">www.sussexwildlifetrust.org.uk/livingseas</a>). The Beaches</p>	<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>	<p>Anticipated direction of change:</p> <p>↑</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5c. Research and education		rMCZ 13.2, Beachy Head West
<p>At Risk project (2003–8), an Anglo-French project that brought together coastal researchers from both sides of the Channel, also involved research in the rMCZ (<a href="http://www.sussex.ac.uk/geography/researchprojects/BAR">www.sussex.ac.uk/geography/researchprojects/BAR</a>). The South Downs Coastal Group carries out research in the area between Selsey Bill and Beachy Head, which includes the rMCZ (<a href="#">Standing Conference on Problems Associated with the Coastline website</a>).</p> <p>It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>		Confidence: High
<p><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Sussex Wildlife Trust undertakes educational activities at their centres or as outreach in schools which may involve the rMCZ (<a href="#">Sussex Wildlife Trust website</a>). Seven Sisters Country Park provides educational resources relating to the maritime cliffs between Brighton and Eastbourne and thus within the rMCZ (<a href="http://www.sevensisters.org.uk/page36">www.sevensisters.org.uk/page36</a>).</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 activities (e.g. events, interpretation boards), from which visitors to the site 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: Moderate</p>

Table 5d. Regulating services		rMCZ 13.2, Beachy Head West
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> the features of the site contribute to the bioremediation of waste (subtidal sediments), water filtration (Blue Mussel beds, Native oyster) and sequestration of carbon (intertidal rock, Blue Mussel beds, Native oyster, subtidal sediments) (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> the features of the site (intertidal rock, Blue</p>	<p>If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (littoral chalk communities) recovered to favourable condition.</p> <p>A potential reduction in the use of bottom towed fishing gear may increase the site's benthic biodiversity and biomass, improving the</p>	<p>Anticipated direction of change:</p> <p>↑</p>

Table 5d. Regulating services		rMCZ 13.2, Beachy Head West
<p>Mussel beds and Native oyster) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p><b>Natural hazard protection:</b> the features of the site, (infralittoral rock, Blue Mussel beds and Native oyster) contribute to local flood and storm protection (Fletcher and others, 2011).</p> <p>It has not been possible to estimate the value derived from regulating services associated with the rMCZ.</p>	<p>regulating capacity its habitats.</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.</p>	<p>Confidence: Low</p>

Table 5e. Non-use and option values		rMCZ 13.2, Beachy Head West
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 rMCZ and the ecosystem services provided, even if they do not currently benefit from them.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with 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 MPAs. 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 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, Lowe, Sanghera, &amp; Solandt, 2012). Voters in the MCS's 'Your Seas Your Voice' campaign felt that features of the natural environment were strong motivators for reasons why people thought that certain locations within the rMCZ should be protected, with people frequently attaching value to biodiversity and 'spectacular scenery.' Other themes that came up quite frequently were the sentiment that they felt "the whole place is amazing" and a feeling of emotional attachment to the site as well. Regarding non-extractive use value, ease of access and the provision of good</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>



Table 5e. Non-use and option values	rMCZ 13.2, Beachy Head West
	<p>facilities were considered important as reasons to protect this site as well as contributions to their well-being and protection for future generations. Furthermore, it is considered to have economic value in terms of tourism, with the high visitor numbers contributing to income to the surrounding area. Its unusual geology and topography are also noted as key attractions. Seafloor protection in this area is thought by many to be a logical extension of the South Downs National Park as it is a wonderful landscape - and the partnership between sea and land is what makes it so special'. In particular MCS nominated the Seven Sisters, which is mainly contained within this rMCZ but also partly in rMCZ 13.1, as this site is considered 'such a special area enjoyed and appreciated by so many people in the crowded South East' and important for national heritage. In addition, its importance to the local and national economy through tourism is highlighted as it 'is a beautiful stretch of coastline with spectacular cliffs and attracts large numbers of visitors from the locality, nationwide and internationally' and its unique habitat 'the chalk wave cut platform is teeming with life' which attracts recreational users such as sea anglers to the site, providing economic benefit to the local community.</p> <p>Source: Ranger et al. (2011)</p>

**rMCZ 16. Kingmere****Site area (km<sup>2</sup>): 47.84**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts				rMCZ 16, Kingmere	
1a. Ecological description					
<p>This recommended Marine Conservation Zone (rMCZ) would protect several excellent examples of rocky habitats, subtidal chalk outcropping reef systems and chalk gullies and hard rock reefs, in particular Kingmere Rocks and Worthing Lumps (both designated as marine Sites of Nature Conservation Importance). These rocky outcrops of sandstone and boulders support a wide range of marine life (e.g. wild populations of native oysters, coralline algae, sea squirts, sponges and starfish) and most notably the most important and productive black bream nesting and spawning area in the Balanced Seas Project Area. Kingmere Rocks encompass a large area of uneven sea bed, consisting of outcrops of sandstone rising 2–3 metres above the surrounding sea bed, with boulders and mixed sediment areas in between. Each level of the outcrops supports different types of marine life, from red algae to encrusting species. Areas between the reefs have a sea bed of mixed sediments (e.g. cobbles, gravel and shells). Most of the wildlife here is mobile, reflecting the unstable nature of the sediments (e.g. hermit crabs and netted dogwhelks). This site is not associated with any Special Area of Conservation, Special Protection Area, Site of Special Scientific Interest or Ramsar site, although, as mentioned above, Worthing Lumps and Kingmere Rocks are marine Sites of Nature Conservation Importance.</p> <p>Source: Balanced Seas Final Recommendations (2011).</p>					
1b. Baseline condition of MCZ features and impact of the MCZ					
Feature	Area of feature (km2)	No. of occurrences	Baseline	Impact	
<b>Broad-scale habitats</b>					
A5.4 Subtidal mixed sediments, where this corresponds to A3.94 Moderate energy infralittoral rock & thin sediments	26.44	-	Unfavourable condition	Recover to favourable condition	
<b>Habitats of Conservation Importance</b>					
Subtidal chalk	0.02	-	Unfavourable condition	Recover to favourable condition	

**rMCZ 16. Kingmere****Site area (km<sup>2</sup>): 47.84**

<b>Species of Conservation Importance</b>				
Native oyster ( <i>Ostrea edulis</i> )		2 records	Favourable condition	Maintain at favourable condition
<b>Non-ENG Feature</b>				
Black bream ( <i>Spondyliosoma cantharus</i> )		4 records	Unfavourable condition	Recover to favourable condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Moderate energy infralittoral rock and thin mixed sediment, Subtidal chalk, Black Bream				

**Site-specific costs arising from the effect of the recommended Marine Conservation Zone on human activities (over 2013 to 2032 inclusive)**

<b>Table 2a. Aggregate extraction</b>		<b>rMCZ 16, Kingmere</b>
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b>		
<b>Management scenario 1:</b> Increase in costs of assessing environmental impacts for future licence applications for existing production licences and current licence applications within 1km of an rMCZ. Additional costs for provision of information that will be used for these assessments will be incurred for the entire suite of sites. A 3-month closure of marine aggregate extraction to mitigate impacts on habitats of nesting black bream <i>Spondyliosoma cantharus</i> , where any shortfall in supply is met by nearby licence areas at no additional cost. This provides the best estimate of impact  <b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications, which is assessed for the entire suite of sites and is not attributed to specific sites. A 3-month closure of marine aggregate extraction to mitigate impacts on habitats of nesting black bream, which is assumed to result in additional costs because shortfalls in supply cannot be met by nearby licence areas.		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2</b>	
There are 3 licensed aggregate extraction production areas within 1km of the rMCZ and 2 additional areas for which licence applications have been submitted. It is anticipated that the Environmental Impact Assessment for		

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<p>renewal of these licences will be conducted in the following years:</p> <ul style="list-style-type: none"> <li>for aggregate extraction production licence nos. 396/1, 396/2, and 453/2: in 2019 (based on information provided by The Crown Estate (pers. comm., 2012));</li> <li>for the applications that are currently being considered for licence nos. 453 and 488: in 2027 (based on information provided by BMAPA (pers. comm., 2011) and assuming that the licences are awarded).</li> </ul>	Average annual site-specific costs £m/yr	Scenario 1	Scenario 2	Best estimate
	Additional costs to the operator for future licence applications	0.003	Assessed for the suite of sites	0.003
	Costs to operator of mitigation	0.000	0.831 plus unknown costs	0.000
	Total	0.003	0.831 plus unknown costs	0.003
<p><b>Scenario 1 :</b> It is assumed that additional costs are incurred for future applications for renewal of existing production licences within 1km of this site. These costs arise from assessing the potential effects of aggregate extraction on the features protected by the rMCZ and are estimated to cost the operator an additional £27,000 per licence application (based on information provided by BMAPA (pers. comm., 2011). An additional cost will also be incurred in provision of information by the British Marine Aggregate Producers Association for these assessments. This cost will be incurred as a result of the entire suite of MCZs and is not included here. Further details of the costs are provided in Annex N1.</p> <p>The operators for both licence application areas (CEMEX UK Marine Limited and Tarmac Marine Dredging Limited) have been engaged in the discussions relating to rMCZ 16 from the outset, and at an early stage offered a 3-month closure on extraction of both areas during the nesting period for black bream as a possible form of mitigation (Balanced Seas Final Recommendations Report, 2011). This is a condition that would be applied to the marine licence for the full 15-year term. From discussions with the aggregate industry, it is not anticipated that the overall tonnage available to the operators would be affected by this mitigation. In Scenario 1 it is assumed that the 3-month closure results in no costs to the operators.</p> <p><b>Scenario 2:</b> An assessment of the additional costs for future licence applications under Scenario 2 is provided for the entire suite of sites, which is summarised in the Evidence Base. Details are provided in Annex H2 and N1.</p> <p>In Scenario 2 it is assumed that the 3 month closure to aggregate extraction to</p>				

Annex I2. Site specific *Impact Assessment materials (Option 2)*

	<p>mitigate impacts on black bream impacts on the supply of aggregates. Additional costs could arise if there is not sufficient capacity in other nearby licence areas to maintain supplies to existing markets during the temporal restriction. In particular, if suitable replacement production licence areas are not within a 12-hour cycle time of the receiving wharves at Shoreham and Newhaven, the cost implications to both operators could be considerable. The costs are estimated at £0.831m/yr (£0.415m/yr per operator) (based on information provided by the British Marine Aggregate Producers Association (BMAPA), pers. comm., 2012). This is based on the annual cost of closure to the business costing £1.662m/yr (using the highest estimate for larger vessels provided by BMAPA to avoid underestimation). This estimated cost does not consider the additional costs per cargo arising from increased wear and tear on vessels from additional distance travelled or the increased routine maintenance costs per cargo arising from a less efficient operating cycle. This scenario would increase greenhouse gas emissions because aggregate supplies would be transported over longer distances.</p>
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Table 2b. Commercial fisheries	rMCZ 16, Kingmere
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></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. Therefore, two scenarios have been employed in the Impact Assessment (IA) for these fisheries to reflect this uncertainty. Should the site be designated, the management that will be required will fall somewhere within this range.</p> <p><b>Management scenario 1:</b> No additional management (Statutory Nature Conservation Bodies (SNCB) informed scenario).</p> <p><b>Management scenario 2:</b>* Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps during the black bream <i>Spondyllosoma cantharus</i> breeding season (end of April to end of June) to protect black bream nesting habitat; for the rest of the year, zoned closure of site to bottom trawls and dredges, to protect areas of medium energy infralittoral rock, leaving a trawling access corridor from north to south through the MCZ (Balanced Seas informed scenario based on stakeholder recommendations).</p> <p><b>Management scenario 3:</b> Closure of the rMCZ to bottom trawls, dredges, lines, nets, pots and traps to protect areas of medium energy infralittoral rock (SNCB informed scenario).</p> <p>*This rMCZ recommendation was put forward by the Regional Stakeholder Group on the basis that seasonal restrictions on all activities throughout the site</p>	

Table 2b. Commercial fisheries		rMCZ 16, Kingmere			
during the black bream nesting period and a permanent restriction on trawling over the thin mixed sediments (REC-specified habitat) would be the agreed management scenario.					
<p><b>Summary of all fisheries:</b> The rMCZ is wholly within the 6 nautical mile (nm) limit and is only fished by UK vessels. The site is mainly fished by vessels based in Shoreham, Newhaven and Littlehampton. Several Selsey-based potters also fish here. The main fishery is potting, followed by set netting and trawling. Most vessels fishing in the site are small static gear boats under 10 metres. Vessels fishing in the site include both under and over 15 metre vessels and e a few larger trawlers based in Shoreham, as well as some based in Newhaven. Bass is an important non-quota species, as is cuttlefish which is caught in trawls, traps and static nets during the spring. The important target species in spring and summer are plaice, Dover sole and black bream, and in winter the target species are whiting, lemon sole and cod (if quota is available) (information from Fisherman interviews).</p> <p>A number of vessels obtain the majority of their earnings from the rMCZ which is heavily fished by trawlers, netters and potters using lobster and whelk pots and cuttlefish traps. The cuttlefish season coincides with the black bream spawning season. Black bream in the Kingmere rMCZ are not currently protected under any byelaws, although the Sussex Inshore Fisheries and Conservation Authority has technical conservation regulations in place that require large mesh cod-ends to be used on trawls during the spawning season, which reduce the incidence of juvenile fish capture.</p> <p>As part of the recommendation for this rMCZ, the fishing industry agreed to cease all fishing activities in the rMCZ during the black bream nesting season if the rMCZ is designated. A number of commercial fishing restrictions are already in existence (listed in Annex E1). More detail on the approach used for the fisheries method is provided at Annexes H7 and N4.</p> <p>Estimated annual value of landings from the rMCZ: £0.304m/yr.</p>					
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries under Policy Option 1 and Polcyy Option 2			
<p><b>ottom trawls:</b> Number of vessels unknown.</p> <p>Estimated total value of landings from the rMCZ: £0.060m/yr (MCZ Fisheries Model).</p>		The estimated annual value of UK bottom trawl landings affected is expected to fall within the following range of scenarios:			
		£m/yr	Scenario 1	Scenario 2	Scenario 3
		Value of landings affected	0.000	0.010	0.060
<p><b>Dredges:</b> Number of vessels unknown.</p> <p>Estimated total value of landings from the rMCZ: £0.029m/yr (MCZ Fisheries Model).</p>		The estimated annual value of UK dredge landings affected is expected to fall within the following range of scenarios:			
		£m/yr	Scenario 1	Scenario 2	Scenario 3
		Value of landings affected	0.000	0.005	0.029

Table 2b. Commercial fisheries		rMCZ 16, Kingmere													
<p><b>Hooks and lines:</b> Number of vessels unknown.</p> <p>Estimated total value of landings from the rMCZ: £0.006 m/yr (MCZ Fisheries Model).</p>		<p>The estimated annual value of UK hook and line landings affected is expected to fall within the following range of scenarios:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td colspan="2">Scenario 3</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.001</td><td colspan="2">0.006</td></tr></table> <p>In establishing the draft conservation objectives, the site’s features may have been assessed as having low vulnerability to fishing with hooks and lines at current levels and, where this is the case, this activity was not the primary reason for assigning the ‘recover’ conservation objectives. As such, it is anticipated that, if additional 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		Value of landings affected	0.000	0.001	0.006	
£m/yr	Scenario 1	Scenario 2	Scenario 3												
Value of landings affected	0.000	0.001	0.006												
<p><b>Nets:</b> Number of vessels unknown.</p> <p>Estimated total value of landings from the rMCZ: £0.076m/yr (MCZ Fisheries Model).</p>		<p>The estimated annual value of UK net landings affected is expected to fall within the following range of scenarios:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td colspan="2">Scenario 3</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.013</td><td colspan="2">0.076</td></tr></table>				£m/yr	Scenario 1	Scenario 2	Scenario 3		Value of landings affected	0.000	0.013	0.076	
£m/yr	Scenario 1	Scenario 2	Scenario 3												
Value of landings affected	0.000	0.013	0.076												
<p><b>Pots and traps:</b> Number of vessels unknown</p> <p>Estimated total value of landings from the rMCZ: £0.133m/yr (MCZ Fisheries Model).</p>		<p>The estimated annual value of UK pot and trap landings affected is expected to fall within the following range of scenarios:</p> <table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td><td colspan="2">Scenario 3</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.022</td><td colspan="2">0.133</td></tr></table>				£m/yr	Scenario 1	Scenario 2	Scenario 3		Value of landings affected	0.000	0.022	0.133	
£m/yr	Scenario 1	Scenario 2	Scenario 3												
Value of landings affected	0.000	0.022	0.133												
Total direct impact on UK commercial fisheries under Policy Option 1 and Policy Option 2															
		<p>The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:</p> <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>0.051</td><td>0.304</td><td>0.038</td></tr></table>				£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate	Value of landings affected	0.000	0.051	0.304	0.038
£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate											
Value of landings affected	0.000	0.051	0.304	0.038											

Table 2b. Commercial fisheries		rMCZ 16, Kingmere			
	GVA affected	0.000	0.023	0.141	0.017
	<p>As part of the recommendation for this rMCZ, the fishing industry agreed to cease all fishing activities during the black bream nesting season (end of April to end of June) within the rMCZ if designated, provided a trawler access channel across the site is allowed for (Balanced Seas Final Recommendations Report, 2011). However, because the cuttlefish season coincides with the black bream breeding season the closure is likely to impact on businesses that are heavily dependent on cuttlefish landings from the closed area. If fishers respond to the seasonal closure by fishing in the surrounding area this is likely to cause gear conflict and result in financial losses. The surrounding area is saturated with gear and working vessels (IA questionnaire response from Brock, B., Shoreham vessel owner and RSG commercial fishing representative, 24 August 2011).</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 overestimate for this site.</p>				
Baseline description of non-UK fisheries		Costs of impact of rMCZ on non-UK commercial fisheries			
		None.			

Table 2c. Recreational anchoring		rMCZ 16, Kingmere
Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2		
<p><b>Scenario 1:</b> recreational anchoring does not impact on sensitive features in the site and so no mitigation of impacts is required.</p> <p><b>Scenario 2:</b> recreational anchoring impacts on sensitive features in the site and a seasonal closure to anchoring over these features by recreational vessels is required (except in emergency circumstances). The seasonal closure would be during the Black Bream breeding season (flexibly for 3 months according to the breeding season, during the summer) and would be over the black bream nesting sites.</p>		
Baseline description of activity	Costs of impact of rMCZ Reference Area on the sector under Policy	



Table 2c. Recreational anchoring		rMCZ 16, Kingmere
		Option 1 and Policy Option 2
<p>Charter angling vessels anchor off the rocks, which is where the sensitive features are located, and fish into the rocks, whereas smaller private angling vessels anchor directly on the rocks using small sacrificial anchors all year round including during black bream breeding season (Balanced Seas Kingmere Site Meeting Report, February 2011). Information is not available on the numbers of vessels.</p> <p>The reefs and wrecks within the site are also popular areas for diving (Balanced Seas East Sussex Site Meeting Report, February 2011) and are used by diving charter boats based at Littlehampton and Brighton and many clubs throughout East Sussex. Numbers of diving boats that anchor over or in the vicinity of the Black Bream nesting sites is not known.</p>		<p><b>Scenario 1:</b> no impact arises because no mitigation is required.</p> <p><b>Scenario 2:</b> The angling sector representatives have agreed that both charter vessels and private boats would cease anchoring on the rocks during the Black Bream breeding season. This would have no impact on the charter boat sector since they anchor off the rocks, but it would impact private boat anglers. However, since both private boat anglers and charter boats have agreed to cease fishing during the black bream breeding season it is anticipated that the impacts on private anglers would not be significant. The diving sector should be able to continue their activities if vessels can anchor outside the nesting areas. If this is not possible then divers and charter boats that currently anchor over the black bream nesting sites during the black bream breeding season will be impacted on during this time.</p>

Table 2d. Recreational angling		rMCZ 16, Kingmere
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area under Policy Option 1 and Policy Option 2</b>		
<p><b>Scenario 1:</b> recreational angling does not impact on sensitive features in the site and so no mitigation of impacts is required.</p> <p><b>Scenario 2:</b> recreational angling impacts on sensitive features in the site and a seasonal closure is required. The seasonal closure would be during the Black Bream breeding season (flexibly for 3 months according to the timing of the breeding season, during the summer) and would be over the black bream nesting sites. . This management scenario was proposed by the Sussex Inshore Fisheries and Conservation Authority (including its angling sector representatives), supported by the Balanced Seas Regional Stakeholder Group</p>		
Description of activity and its impact on interest features		Costs of effect of rMCZ on the sector under Policy Option 1 and Policy Option 2
<p>This is a popular spot for angling with both local and non-local anglers all year round (including during the black bream breeding season). This site is renowned nationally for having one of the best populations of black bream in the south-east and as such attracts anglers from all over the country at certain times of year (Stakmap 2010). Charter boats in the area particularly</p>		<p><b>Scenario 1:</b> no impact arises because no mitigation is required.</p> <p><b>Scenario 2:</b> Representatives of both private recreational sea anglers and of charter boat operators from Littlehampton and further afield said the impact of seasonal closure of this area would be acceptable in order to protect the black</p>

Table 2d. Recreational angling	rMCZ 16, Kingmere
depend on black bream fishing, including vessels based in Chichester (5 vessels), Shoreham (1 vessel), Selsey (2 vessels) and Brighton (11 vessels) with the closest fleet based at Littlehampton (15 vessels) (Stakmap 2010; Balanced SeasKingmere Site Meeting Report, February 2011). Charters launched from Littlehampton have a maximum radius of activity of 10 miles from their home port due to the conditions needed to enter and exit Littlehampton harbour (Stakmap 2010), which makes the Kingmere area particularly important for them.	bream brood stock and that they could continue to operate by using other adjacent areas (Sussex Sea Angling Network letter to Balanced Seas read out at the Kingmere Site Meeting, February 2011). As numbers of anglers using the exact location concerned is unknown, it is not possible to quantify the impact, but stakeholders have indicated that it would be sufficiently small as to be negligible.

Table 2e: Other impacts that are assessed for the suite of MCZs under Policy Option 1 and Policy Option 2 and not for this site alone	rMCZ 16, Kingmere
<p><b><i>Oil and gas related activities (including carbon capture and storage)</i></b></p> <p>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 oil and gas related activities are assessed in the Evidence Base, Annex H11 and Annex N10 (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 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ . 16, Kingmere
<p>Cables (existing interconnectors and telecom cables)</p> <p>Commercial fisheries (mid-water trawls)</p> <p>Recreation</p> <p>Research and education</p> <p>Shipping</p>	

### Contribution to Ecological Network Guidance

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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 <sup>25</sup>								rMCZ 16, Kingmere	
✓ = 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-ativity	Replication	Adequacy	Viability	Gaps or shortfalls in relation to ENG minimum guidelines	Recommended conservation objective	Quantitative considerations at regional MCZ level		
<b>Subtidal chalk</b>	FOCI Habitat	✓	✓	✓	None	Recover			BAP habitat
<b>Native oyster <i>Ostrea edulis</i></b>	FOCI Species	✓	✓	✓	None	Maintain			BAP and OSPAR species
<b>A5.4 *<sup>5</sup> Subtidal mixed sediments</b>	BSH	✓	✓	✓	None	Recover			
<b>Black bream <i>Girella elevata</i></b>	Non-ENG	N/A	N/A	N/A	None	N/A		Important breeding area and only site in the region proposed for this	

<sup>25</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

								feature <sup>1</sup>	
<b>Site considerations</b>									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * <sup>1</sup>					
Overlaps with existing MPAs				X * <sup>2</sup>					

### **Additional comments and site benefits:**

<sup>1</sup>Non-ENG feature proposed for designation at this site: Black bream (*Spondyllosoma cantharus*) nesting and spawning sites. ENG features undulate rays, blue mussel beds and Ross worm reefs are also found within the site but not recommended.

<sup>2</sup>Two marine Sites of Nature Conservation Importance (mSNCI) overlap with this site (Kingmere Rocks and Worthing Lumps). These sites have been designated by East and West Sussex County Council with the support of SeaSearch.

This area is a Key Inshore Biodiversity area in the Balanced Seas region (South East England Biodiversity Forum (SEEBF) 2010).

This is the only site designated (in the regional project, to be confirmed whether it is also the only site nationally) for the non-ENG feature, black bream (Balanced Seas 2011a). It is possibly the most important breeding site for black bream and the best studied area in the UK for Black bream in the Balanced Seas region and has scientific value as it is well studied (Lythgoe and Lythgoe 1971, Pawson 1995, EMU Ltd 2007a, EMU Ltd 2007b, EMU Ltd 2008a, EMU Ltd 2008b).

This site contains several excellent examples of rocky habitats and subtidal chalk outcropping reef systems. These rocky outcrops of sandstone and boulders support a wide range of marine life, such as bryozans, coralline algae, sea squirts, sponges and starfish (R. Irving 1996, Williams and Clark 2010).

Oysters appear to be unexploited in this site (Balanced Seas 2011a).

Sublittoral rocky reefs account for approximately less than 3% of the total area of sea bed of Sussex (within the 12nm limit); Kingmere Rocks is an example of a sandstone reef area with a rich diverse fauna associated with it (Balanced Seas 2011a).

Undulate rays are present in the site. Some that have been caught were close to the British record size (Balanced Seas 2011a). Fish species such as Poor cod have been recorded in this site (Williams and Clark 2010).

Blue mussel beds and Ross worm reefs also occur in this site but they have not been put forward for protection.



The submerged landscape of the Paleo Arun transects North to South of the Kingmere rMCZ in the Western part of the site are associated with deep coarse sediment, these include river terrace deposits and channel infill (James, Pearce, et al. 2010, James, Pearce, 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 16, Kingmere
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p>Fletcher and others (2011) 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.</p> <p>This rMCZ comprises predominantly subtidal mixed sediments which are an important nursery area for many species and can provide important nursery grounds for juvenile commercial species such as flatfishes and bass. The area of primary conservation interest is where this sediment overlays moderate energy infralittoral rock which is an important location for commercial inshore fishing activity, particularly crab and lobster (Fletcher and others, 2011). The site contains the most important black bream nesting and spawning area in the Balanced Seas Project Area (Balanced Seas Final Recommendations Report, 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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>The main fishery is potting, followed by set netting and trawling. Important target species in spring and summer are plaice, Dover sole and black bream and in winter the target species are whiting, lemon sole and cod (if quota is available). Bass is an important non-quota species, as is cuttlefish. A description of on-site fishing activity and the value derived from it is set out in Table 2b.</p> <p>It has not been possible to estimate the value of the off-site benefits that derive from spawning and nursery areas.</p>	<p>If the conservation objectives of the features are achieved, some of the features will recover to favourable condition. One (native oyster) will be maintained in favourable condition.</p> <p>New management of fishing activities is expected (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>As most of the commercial species targeted by fishers in this area are mobile fish and crustaceans, 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>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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ 16, Kingmere
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5b. Recreation		rMCZ 16, Kingmere
<p><b>Angling:</b> Fletcher and others (2011) 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>Infralittoral and subtidal mixed sediments support high biodiversity within the site and provide spawning and nursery grounds for many juvenile commercial fish species, all of which are therefore important habitats for fish and shellfish fisheries (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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>The rMCZ is an extremely popular angling destination all year round with activity particularly intense at certain times of the year due to this being the best known area for black bream. The potential spawning ground for flatfishes and generally high biodiversity due to the complex habitats within the site are likely to help to support potential on-site and off-site fisheries. A description of on-site angling activity and the value derived from it is set out in Table 2d.</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site that result from the potential spawning and nursery area.</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>The recovery of the broad scale habitats to favourable condition may improve their functioning as a nursery area, potentially benefiting fisheries exploited within and outside the rMCZ (see Table 4a).</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 angling trips at the national scale.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Low</p>
<p><b>Diving:</b> Diving is not known to take place in the rMCZ.</p>	<p>N/a.</p>	<p>n/a</p>
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The baseline quantity and quality of the ecosystem service provided is</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>The recovery of the broad scale habitats to favourable condition</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5b. Recreation		rMCZ 16, Kingmere
<p>assumed to be commensurate with that provided by the features of the site when some are in favourable condition and some are in unfavourable condition (see Table 1 for details).</p> <p>Due to its offshore location the rMCZ is not an important area for wildlife watching. However, the site has particularly high biodiversity and abundant fish populations, which may support foraging birds and potentially marine mammals. The site occurs within an area of the Channel used by ferries, which may carry wildlife watchers.</p> <p>It has not been possible to estimate the value derived from wildlife watching in the rMCZ.</p>	<p>may improve their functioning as support for fish, bird and marine mammal populations. 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. Visitors in transit across the Channel may benefit from any increased biodiversity through more regular sightings of birds and marine mammals.</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>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.</p>	<p>Confidence: Low</p>
<b>Other recreation:</b> Tourism is not known to take place in the rMCZ	N/A	N/A

Table 5c. Research and education		rMCZ 16, Kingmere
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> Fletcher and others (2011) 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 formal research activities are currently carried out in the rMCZ. However, ferries crossing the Channel may be used by marine mammal observers whose data contribute to national databases.</p> <p>It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>Monitoring of the pMCZ 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>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<b>Education:</b> Fletcher and others (2011) identify that the features to be	As the rMCZ is approximately 6km offshore and therefore	Anticipated



Annex I2. Site specific *Impact Assessment materials (Option 2)*


Table 5c. Research and education		rMCZ 16, Kingmere
protected by the rMCZ can contribute to the delivery of education services.  No known education activity occurs in this rMCZ.	relatively inaccessible, no benefits are likely to arise from direct use of the site for education.  Non-visitors may benefit if the rMCZ contributes to external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	direction of change:    Confidence: Low


Table 5d. Regulating services		rMCZ 16, Kingmere
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> the features of the site contribute to the bioremediation of waste (subtidal sediments), water filtration (Native oyster) and sequestration of carbon (intertidal rock, Native oyster, subtidal sediments) (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> the features of the site (Native oyster) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p><b>Natural hazard protection:</b> as the site is offshore, its features are not thought to contribute to the delivery of this service (Fletcher and others, 2011).</p> <p>It has not been possible to estimate the value derived from regulating services associated with the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (infralittoral rock, subtidal mixed sediments and subtidal chalk) recovered to favourable condition.</p> <p>Recovery of the infralittoral rock and subtidal mixed sediments and a potential reduction in the use of bottom towed fishing gear may increase the site's benthic biodiversity and biomass, improving the regulating capacity its habitats.</p> <p>Designating the pMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.</p>	<p>Anticipated direction of change:</p> <p></p> <p>Confidence: Low</p>

Table 5e. Non-use and option values	rMCZ 16, Kingmere
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Table 5e. Non-use and option values		rMCZ 16, Kingmere
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 pMCZ and the ecosystem services provided, even if they do not currently benefit from them.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with the rMCZ.</p>	<p>The pMCZ will benefit the proportion of the UK population that values conservation of the pMCZ features and its contribution to an ecologically coherent network of MPAs. 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 pMCZ will 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, Lowe, Sanghera, &amp; Solandt, 2012). Voters in the MCS's 'Your Seas Your Voice' campaign felt that features of the natural environment were strong motivators for reasons why people thought that nominated locations within this pMCZ should be protected, with people frequently attaching value to biodiversity and its importance for their recreational pursuit particularly divers and sea anglers who value the 'wide range of plants and animals'. Allowing species recovery, particularly fish and shellfish, was perceived as an important management reason to protect the site. The MCS nominated site Worthing Lumps occurs in this site and the 'sealife there is extensive, and we have seen many small fish, recently hatched, as well as a huge variety of sponges and corals' highlighting the area as biodiverse and a nursery area for fish which would benefit recreation and tourism in 'a heavily populated suburban and urban sprawl with a long history of fishing. Currently there is little local awareness of the richness of the natural coast line or of the remaining reservoir of marine species to be found along the submerged cliffs' Source: Ranger et al. (2011).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

**2.3rMCZ 25.1 Pagham Harbour****Site area (km<sup>2</sup>): 2.70**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts			rMCZ 25.1, Pagham Harbour	
1a. Ecological description				
<p>This recommended Marine Conservation Zone (rMCZ) would protect Defolin’s lagoon snail, the lagoon sand shrimp, European eel and seagrass, complementing the protection already provided to the intertidal salt marsh, tidal mudflat habitats and associated invertebrate communities found in the harbour and the geologically mobile shingle spit at the harbour mouth. The spit is one of only two known locations in the Balanced Seas Project Area for the exceptionally rare Defolin’s lagoon snail. Seagrass beds form an important part of the intertidal and subtidal environment and European eel elvers are known to be present. The lagoon sand shrimp occurs in Ferry Pool, a small water body above the mean high water mark, and Pagham Harbour is also noted for its high benthic species richness and benthic biotope richness. Pagham Harbour is the easternmost of a series of drowned river valleys and shallow estuaries. The harbour provides important habitats for foraging, breeding, loafing, moulting, rafting and resting wildfowl, while acting as a nursery ground for particular fish species. Grey seal and common seal have also been recorded in the harbour. The shingle coastline also provides ideal conditions for breeding common and little tern and other shorebirds, and roosting sites for waders. The near-shore waters provide important wintering grounds for species of waterfowl, including important populations of Slavonian grebe. This site overlaps with the Pagham Harbour Local Nature Reserve, Site of Special Scientific Interest, Ramsar site and Special Protection Area.</p> <p>Source: Balanced Seas Final Recommendations (2011) and Balanced Seas Final Recommendations Amendment Report (December 2011).</p>				
1b. Baseline condition of MCZ features and impact of the MCZ				
Feature	Area of feature (km2)	No. of occurrences	Baseline	Impact
<i>Habitats of conservation importance</i>				
Seagrass	0.03	-	Favourable condition	Maintain at favourable condition
<i>Species of conservation importance</i>				
Defolin’s Lagoon Snail ( <i>Caecum armoricum</i> )	-	1 record	Favourable condition	Maintain at favourable condition

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Lagoon Sand Shrimp ( <i>Gammarus insensibilis</i> )	-	3 records	Favourable condition	Maintain at favourable condition
European Eel ( <i>Anguilla anguilla</i> )	N/A	-	Favourable condition	Maintain at favourable condition
<p><b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>Seagrass beds, Defolin's Lagoon Snail, Lagoon sand shrimp</p>				

**Site-specific costs arising from the effect of the recommended Marine Conservation Zone on human activities (over 2013 to 2032 inclusive)**

<b>Table 2a. Archaeological heritage</b>		<b>rMCZ 25.1, Pagham Harbour</b>
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy 2</b>		
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.		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2</b>	
Eleventh-century earthworks and traces of iron-age occupation have been recorded within the site. There is also a World War II pillbox. One wreck is recorded within the site, but it is not dated or named (English Heritage, 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 depending on the size of the MCZ (English Heritage, pers. comm., 2012). No further impacts on activities related to archaeology are anticipated.	

<b>Table 2b: Other impacts that are assessed for the suite of MCZs under Policy Option 1 and Policy Option 2 and not for this site alone</b>	<b>rMCZ 25.1, Pagham Harbour</b>
<b>Oil and gas related activities (including carbon capture and storage)</b>	
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 oil and gas related activities are assessed in the Evidence Base, Annex H11 and Annex N10 (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)

<b>Table 3. Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ 25.1 Pagham Harbour</b>
Recreation Research and education Water abstraction, discharge and diffuse pollution*.	

\*The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>26</sup>  ✓ = 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 25.1, Pagham harbour	
<b>ENG Feature</b>	<b>Represent- ativity</b>	<b>Replication</b>	<b>Adequacy</b>	<b>Viability</b>	<b>Gaps or shortfalls in relation to ENG minimum</b>	<b>Recommended conservation objective</b>	<b>Quantitative considerations at regional MCZ</b>	<b>Ecological Importance at regional</b>	<b>Ecological Importance at wider scale</b>

<sup>26</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

					guidelines		level	MCZ level	
Seagrass beds	FOCI Habitat	✓	✓	✓	None	Maintain			BAP and OSPAR habitat
Defolin's lagoon snail <i>Caecum armoricum</i>	FOCI Species	✓	✓	✓	None	Maintain	This is one of two regional, and three national occurrences of this exceptionally rare feature	This feature is not protected within existing MPAs.	This is one of three national occurrences of this feature.  Listed on Schedule 5 of Wildlife and Countryside Act
Lagoon sand shrimp <i>Gammarus insensibilis</i>	FOCI Species	✓	✓	✓	None	Maintain	Three out of four replicates are viable so adequacy is just met (at minimum ENG target)		BAP species and listed on Schedule 5 of Wildlife and Countryside Act
European eel <i>Anguilla anguilla</i>	FOCI Mobile species	✓	✓	N/A	None	Maintain		Important area for key life stages.  Not protected by existing designations at RP and biogeographic level.	BAP species - International responsibility and moderate decline in UK.
Site considerations									

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Connectivity	✓
Geological/Geomorphological features of interest	✓
Appropriate boundary	✓
Areas of Additional Ecological Importance	✓ * <sup>1</sup>
Overlaps with existing MPAs	✓

**Additional comments and site benefits:**

<sup>1</sup> Site supports high benthic species richness and benthic biotope richness (Defra n.d.); provides important wintering grounds for species of waterfowl including important populations of Slavonian Grebe (Environment Agency 2010a); is a breeding area for nationally and internationally important bird species such as common and little tern; grey seals and common seals have been recorded in the harbour; and the site provides nursery areas for a number of fish species including bass, mullet and black bream (Balanced Seas 2011a).

Site is an important area for key life stages of the European eel (*Anguilla anguilla*) a BAP species of International responsibility and moderate decline in the UK.

**Anticipated benefits to ecosystem services**

The habitats, species and other ecological features of the 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 25.1, Pagham Harbour
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
No commercial fishing is known to take place in the recommended Marine Conservation Zone.	N/A	

Table 5b. Recreation		rMCZ 25.1, Pagham Harbour
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5b. Recreation	rMCZ 25.1, Pagham Harbour	
<p><b>Angling:</b> Fletcher and others (2011) 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 seagrass beds found within this rMCZ provide important nursery areas for flatfish (Joint Nature Conservation Committee, 2011) and, as such, are likely to help support potential on-site and off-site angling activities (Fletcher and others, 2011). 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 1 for details).</p> <p>Pagham is a popular location for shore anglers, but within the rMCZ (Pagham Harbour itself), angling is managed through a permitting scheme and a maximum of about 25 permits are issued each year. Those who use this location, greatly appreciate it because of the lack of marine traffic and rich wildlife (T Osborne Letter, July 2011) both above and below water. Large numbers of shore anglers fish on the seaward side of the spit, but generally cast their lines beyond MHW mark and thus outside the rMCZ.</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site which result from the spawning and nursery areas.</p>	<p>If the conservation objectives of the features are achieved, all features will be maintained in favourable condition.</p> <p>As no additional management of angling is expected (other than some restrictions on anchoring locations), fishers will be able to benefit from any on-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, both on and off-site</p> <p>-</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p><b>Diving:</b> Diving does not take place in the rMCZ.</p>	<p>N/A</p>	<p>N/A</p>



Table 5b. Recreation	rMCZ 25.1, Pagham Harbour	
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that 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 (see Table 1 for details).</p> <p>The seagrass beds found within this rMCZ provide a safe haven for juvenile fish and other species such as sea horse, sea anemone and sessile jellyfish (Natural England website, seagrass beds article). These contribute to an area of high biodiversity, which in turn may support foraging areas for sea birds such as little egret, ringed plover and lapwing. The rMCZ is also an important breeding area for little tern (<a href="#">RSPB website</a>).</p> <p>The rMCZ is a popular area for bird watching, as the site overlaps with the Pagham RSPB reserve (<a href="#">RSPB website</a>).</p> <p>It has not been possible to estimate the value derived from wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, all features will be maintained in favourable condition.</p> <p>As no additional management of recreation is expected visitors will be able to benefit from any on-site beneficial effects. If the rMCZ results in an increase in the diversity of species then this is expected to increase the attraction to visitors, which may benefit the local economy. This increase may represent a redistribution of location preferences rather than an overall increase in wildlife watching trips at the national scale. 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.</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>
<p><b>Other recreation:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The rMCZ is a popular recreational area for visitors and residents for sailing (<a href="http://paghamyachtclub.com/sailing/">http://paghamyachtclub.com/sailing/</a>), wildfowling and coastal walking.</p> <p>It has not been possible to estimate the value derived from other recreational activities in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, all features will be maintained in favourable condition.</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.</p> <p>If the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by the tourism and leisure industry and that would be expected to increase</p>	<p>Anticipated direction of change:</p> <p>↔</p> <p>Confidence: Moderate</p>

Table 5b. Recreation	rMCZ 25.1, Pagham Harbour
	visitation rates.

Table 5c. Research and education	rMCZ 25.1, Pagham Harbour	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can contribute to the delivery of research services.</p> <p>This rMCZ is broadly concurrent with the Pagham Harbour Local Nature reserve which is managed by the RSPB. Annual biological recording and monitoring is conducted by the Reserve Rangers and volunteers from various non governmental organisations such as Sussex Wildlife Trust and the Environment Agency including bird counts, water quality, salinity and algae/vegetation sampling (<a href="#">Reserve Manager's Report, 2010</a>).</p> <p>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 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>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>
<p><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>Pagham LNR has a dedicated Education Officer who organises school visits to the site. In addition, wildfowl and wader walks and birdwatching workshops are regular events (<a href="#">Reserve Manager's Report, 2010</a>). There is a purpose built education centre next to the visitor centre accommodating more than 30 pupils and the reserve</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 activities (e.g. events, interpretation boards), from which visitors to the site would derive benefit.</p> <p>Non-visitors may benefit if the rMCZ contributes to wider provision</p>	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ 25.1, Pagham Harbour
organises national curriculum tailored classes and fieldwork ( <a href="#">RSPB website</a> )	of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	
It has not been possible to estimate the value derived from education activities associated with the rMCZ.		

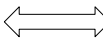
Table 5d. Regulating services		rMCZ 25.1, Pagham Harbour
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> The features of the site (seagrass beds) contribute to water purification and the sequestration of carbon (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> The features of the site are not known to contribute to resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p><b>Natural hazard protection:</b> The features of the site (seagrass beds) contribute to local flood and storm protection through erosion control (Fletcher and others, 2011).</p> <p>It has not been possible to estimate the value derived from regulating services associated with the pMCZ.</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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p> <p>Confidence: Moderate</p>

Table 5e. Non-use and option values		rMCZ 25.1, Pagham Harbour
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an	Anticipated direction of



Annex I2. Site specific *Impact Assessment materials (Option 2)*

<p>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.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with the pMCZ.</p>	<p>ecologically coherent network of MPAs. 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 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, Lowe, Sanghera, &amp; Solandt, 2012). Voters in the MCS's 'Your Seas Your Voice' campaign felt that features of the natural environment were strong motivators for reasons why people thought that areas within the rMCZ should be protected, with people frequently attaching value to biodiversity and 'spectacular scenery.' Other themes that came up quite frequently were the sentiment that they felt "the whole place is amazing" and that the site 'appears unspoilt'.</p> <p>Source: Ranger and others. (2011)</p>	<p>change:</p> <p>Confidence: Moderate</p>
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**rMCZ 26 Hythe Bay**

**Site area (km<sup>2</sup>): 41.55**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts	rMCZ 26, Hythe Bay
1a. Ecological description	
This recommended Marine Conservation Zone (rMCZ) would protect an extensive area of subtidal mud, which supports a rich sea-pen and burrowing	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

megafauna community and dense populations of unusual molluscs, burrowing crustaceans and polychaetes. This community is extremely species-rich and contains many species rare in the south-east (e.g. spoonworm and a burrowing anemone). Overall, the site is considered a biodiversity hotspot within the Balanced Seas Project Area. This site is not associated with any existing designations.

Source: Balanced Seas Final Recommendations (2011).

<b>1b. Baseline condition of MCZ features and impact of the MCZ</b>				
<b>Feature</b>	<b>Area of feature (km2)</b>	<b>No. of occurrences</b>	<b>Baseline</b>	<b>Impact</b>
<b><i>Broad-scale habitats</i></b>				
A5.3 Subtidal mud	37.02	-	Unfavourable condition	Recover to favourable condition
<b><i>Habitats of conservation importance</i></b>				
Mud habitats in deep water	-	79 records	Unfavourable condition	Recover to favourable condition
Seapens & burrowing megafauna	-	28 records	Unfavourable condition	Recover to favourable condition
<b>Option 2:</b> This site is proposed for designation in 2012 for all three features listed above.				

**Site-specific costs arising from the effect of the recommended Marine Conservation Zone on human activities (over 2013 to 2032 inclusive)**

<b>Table 2a. Archaeological heritage</b>		<b>rMCZ 26, Hythe Bay</b>
<b><i>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</i></b>		
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.		
<b>Baseline description of activity</b>	<b>Costs of impact of MCZ on the sector under Policy Option 1 and Policy Option 2</b>	
Several World War II defence aids/structures are recorded in the site including anti-tank obstacles, obstructions and pillboxes. Vessel wrecks of British and French origin are recorded within the site (English Heritage, 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 depending	

Table 2a. Archaeological heritage	rMCZ 26, Hythe Bay
	<p>on the size of the MCZ (English Heritage, pers. comm., 2012). 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 IA. 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.</p>

Table 2b. Commercial fisheries	rMCZ 26, Hythe Bay
<p><b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b></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. Therefore, three scenarios have been employed in the Impact Assessment (IA) for these fisheries to reflect this uncertainty. Should the site be designated, the management that will be required will fall somewhere within this range.</p> <p><b>Management scenario 1:</b> No additional management (Statutory Nature Conservation Bodies (SNCB) informed scenario).</p> <p><b>Management scenario 2:</b> Zoned closure of areas of rMCZ to bottom trawls and dredges to protect areas of sub-tidal mud and sea-pen and burrowing megafauna communities and mud habitats in deep water (Balanced Seas informed scenario based on stakeholder recommendations; the boundaries of the 6 areas proposed for closure to bottom gear were developed by a subset of Regional Stakeholder Group members, including fisheries representatives). The Folkestone fleet agreed to cease trawling in rMCZs 11.1, 11.2 and 11.4 provided that rMCZ 26 is not uniformly closed to trawling but that the 'management areas' put forward during discussions are adhered to if the site is designated (Balanced Seas Final Recommendations report, September 2011).</p> <p><b>Management scenario 3:</b> Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (SNCB informed scenario).</p> <p><b>Summary of all fisheries</b> This site is wholly within the 6 nautical mile (nm) limit and is fished only by UK vessels. Vessels that fish in the site are based at</p>	

Table 2b. Commercial fisheries		rMCZ 26, Hythe Bay			
Folkestone (5 trawlers). Hythe, Dungeness, Rye and nomadic vessels also use the site. The site supports a mixed fishery. In general, smaller beach-based vessels use set nets and pots, and harbour-based vessels use bottom trawls. The site is within International Council for the Exploration of the Sea (ICES) Rectangle IVc (North Sea), but the boundary with ICES Rectangle VIId (English Channel) lies very close to the rMCZ to the south (51 degree North parallel of latitude) which means that depending on quota restrictions, this rMCZ can be a very important area for fisheries. Certain commercial fishing restrictions are already in existence (listed in Annex E1). More detail on the approach used for the fisheries method is provided in Annexes H7 and N4.					
Estimated annual value of landings from the rMCZ: £0.075m/yr.					
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries under Policy Option 1 and Policy Option 2			
<b>Bottom trawls:</b> Number of vessels unknownEstimated total value of landings from the rMCZ: £0.022m/yr (MCZ Fisheries Model).		The estimated annual value of UK bottom trawl landings affected is expected to fall within the following range of scenarios:			
		£m/yr	Scenario 1	Scenario 2	Scenario 3
		Value of landings affected	0.000	0.002	0.022
<b>Dredges:</b> Number of vessels unknown. Estimated total value of landings from the rMCZ: £0.004m/yr.		The estimated annual value of UK dredge landings affected is expected to fall within the following range of scenarios:			
		£m/yr	Scenario 1	Scenario 2	Scenario 3
		Value of landings affected	0.000	<0.001	0.004
<b>Nets:</b> Number of vessels unknown. Estimated total value of landings from the rMCZ: £0.039m/yr (MCZ Fisheries Model)		The estimated annual value of UK net landings affected is expected to fall within the following range of scenarios:			
		£m/yr	Scenario 1	Scenario 2	Scenario 3
		Value of landings affected	0.000	0.000	0.0039
In establishing the draft conservation objectives, the site’s features may have been assessed as having low vulnerability to fishing with nets at current levels and, where this is the case, this activity was not the primary reason for assigning the ‘recover’ conservation objectives. As such, it is anticipated that, if additional 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 2b. Commercial fisheries		rMCZ 26, Hythe Bay			
<b>Pots and traps:</b> Number of vessels unknown. Estimated total value of landings from the rMCZ: £0.010m/yr (MCZ Fisheries Model).	The estimated annual value of UK pot and trap landings affected is expected to fall within the following range of scenarios:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	
	Value of landings affected	0.000	0.000	0.0010	
	In establishing the draft conservation objectives, the site’s features may have been assessed as having low vulnerability to fishing with pots and traps at current levels and, where this is the case, this activity was not the primary reason for assigning the ‘recover’ conservation objectives. As such, it is anticipated that, if additional 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 on UK commercial fisheries under Policy Option 1 and Policy Option 2					
	The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:				
	£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate
	Value of landings affected	0.000	0.003	0.075	0.006
	GVA affected	0.000	0.001	0.033	0.003
	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 overestimate for this site.				
An interview with a representative of the Folkestone fleet (IA questionnaire					



<b>Table 2b. Commercial fisheries</b>		<b>rMCZ 26, Hythe Bay</b>
	response from Griggs, A., Folkestone vessel owner, 22 August 2011).indicated that closure of the entire site to bottom trawls will affect trawlers from Folkestone and Rye. The fisheries representative suggested that displacement of effort would not be viable as there are no other fishing grounds available and diversification is limited because all available species are already fished using appropriate gears (see Annex J3a for more detail). He anticipated that if the site is fully closed, local vessels would experience a serious loss of revenue, which could lead them to leave the fleet and that, as a result an estimated 10 fishers would lose their livelihoods which would impact on their families and would have an important social impact on local fishing communities. He estimated that the closure could cause Folkestone Trawlers Ltd to experience a loss of earnings of up to 80% while also having indirect impacts on the local fish market, restaurants, fish retailers and businesses linked to the fishing sector such as repairs, fuel services and gear suppliers. For this reason, the Folkestone fleet has recommended Scenario 2 described above.	
<b>Baseline description of non-UK fisheries</b>	<b>Costs of impact of rMCZ on non-UK commercial fisheries</b>	
	None.	

<b>2c. National defence</b>		<b>rMCZ 26, Hythe Bay</b>
<b>Source of costs of the recommended Marine Conservation Zone (rMCZ) under Policy Option 1 and Policy Option 2</b>		
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. The MOD will also incur costs in revising environmental tools and charts to include MCZs.		
<b>Baseline description of activity</b>	<b>Cost of impact of rMCZ to the sector under Policy Option 1 and Policy Option 2</b>	
The MOD is known to make use of the site for machine gun firing.	It is not known whether this rMCZ will impact on the MOD's use of the site. Impacts of rMCZs on national defence are assessed in Annex H10 and N9	

2c. National defence	rMCZ 26, Hythe Bay
	(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 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 26, Hythe Bay
Commercial Fisheries (collection by hand, hooks and lines, mid-water trawls) Ports Recreation Research and education Shipping Water abstraction, discharge and diffuse pollution*.	

\*The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>27</sup>  ✓ = 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 26, Hythe Bay
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<sup>27</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

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
A5.3 Subtidal mud	BSH	✓	✓	✓	None	Recover	This feature provides greater contribution to the adequacy target than any other site in the regional project		
Mud habitats in deep water	FOCI Habitat	X	X	✓	Replication for this feature has not been met.	Recover	This is one of two rMCZs for this feature (minimum target is three).	This feature is not protected within existing MPAs.	BAP habitat
Sea-pens and burrowing megafauna	FOCI Habitat	✓	✓	✓	None	Recover	This is one of three sites for this feature (minimum is three which one has been captured in and existing MPA.	The biotope in this location is unusual and richer than the national biotope description.	OSPAR habitat
<b>Site considerations</b>									
Connectivity				✓					

## Annex I2. Site specific *Impact Assessment materials (Option 2)*

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

### Additional comments and site benefits:

<sup>1</sup>The sea pen and burrowing megafauna biotope is richer in this site than the national biotope description and is nationally distinctive due to the high species density (Balanced Seas 2011a). Samples contain Spoonworm (*Maxmuelleria lankesteri*), a dominance of Ampelisca (*tenuicornis/brevicornis*) in some places, the burrowing anemone (*Cerianthus llyodii*) and large burrowing shrimps (*Callinassa* and *Upogebia*). There is high abundance of the burrowing mollusc (*Saxicavella jeffreysi*). *Phoronis muelleri* and *P. pallida* also occur in the site (Kent Wildlife Trust (KWT) 2010, Tebble 1966).

<sup>2</sup>The FOCI habitat Ross worm reef *Sabellaria spinulosa* is present but it is not the best example in the region (data sourced from the EA database, 1983 and 1984). The FOCI species native oysters (*Ostrea edulis*), and FOCI and mobile species european eel (*Anguilla anguilla*), smelt (*Osmerus eperlanus*) and undulate rays (*Raja undulata*) also occur in this site (Balanced Seas 2011a).

<sup>3</sup> The site provides foraging grounds for great cormorant and various Tern and Gull species (RSPB). Nursery and spawning areas for fish such as undulate ray and sole (Cefas).

The burrowing mollusc, *Saxicavella jeffreysi* is highly abundant and found in the site at densities of almost 1000 individuals per m2. This is uncommon in the British Isles (Tebble 1966).

This site is considered to be a Key Inshore Biodiversity Area within the Balanced Seas area (South-East England Biodiversity Forum, 2010).

### Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the 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 26, Hythe Bay**

Table 5a. Fish and shellfish for human consumption		rMCZ 26, Hythe Bay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p>Fletcher and others (2011) 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.</p> <p>Subtidal mud, the principal habitat in the rMCZ, is an important nursery area for many species, including for juvenile commercial species such as flatfishes and bass (Fletcher and others, 2011). 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 1 for details).</p> <p>The site supports a mixed fishery. In general, smaller beach-based vessels use set nets and pots and harbour-based vessels use bottom trawls. 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, subtidal mud and the other features in this site will be recovered to favourable condition.</p> <p>New management of fishing activities is expected (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>As most of the commercial species targeted by fishers in this rMCZ are mobile fish and shellfish, 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. However, maintaining and monitoring the current level of potting practices and restricting other fishing practices over certain features will safeguard the healthy population of shellfish and by ensuring no increase in fishing activity occurs or alternative gears used, it is expected that the shellfish and other fish species population may increase over time.</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>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ 26, Hythe Bay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Angling:</b> Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) can</p>	<p>If the conservation objectives of the features are achieved, all of the features will be recovered to favourable condition.</p>	<p>Anticipated direction of</p>





Table 5b. Recreation		rMCZ 26, Hythe Bay
<p>contribute to the delivery of fish and shellfish for human consumption and recreation services.</p> <p>Subtidal mud habitats support nursery grounds for many juvenile commercial fish species, which are therefore important habitats for fish and shellfish fisheries (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 unfavourable condition (see Table 1 for details).</p> <p>The rMCZ is a popular area for shore and private boat angling and charter boat fishing (StakMap, 2010). Due to the complex habitats within the site and the generally high biodiversity, it is likely to help support potential on-site and off-site fisheries.</p> <p>It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site which result from any spawning and nursery areas.</p>	<p>The recovery of the broad scale habitats to favourable condition may improve their functioning as a nursery area, potentially benefiting fisheries exploited within and outside the rMCZ (see Table 4a).</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 is likely to arise from a change in anglers' preferred angling locations rather than an increase in days spent angling or the number of anglers at a national scale.</p>	<p>change:</p>  <p>Confidence: Low</p>
<p><b>Diving:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The rMCZ is used for shore diving, particularly from Sandgate and along to Hythe (<a href="http://www.oceanodyssey.co.uk/kentshoredives.htm">www.oceanodyssey.co.uk/kentshoredives.htm</a>) and boat diving on the wrecks takes place in the rMCZ.</p>	<p>Designation of this site might lead to an increase in diving trips, as a result of publicity about the marine biodiversity and rare species found in the site. If populations of species such as seahorses and littoral chalk communities increase, this could lead to an improved quality of experience for divers. This increase may represent a redistribution of location preferences rather than an overall increase in diving trips at the national scale.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: Low</p>

Table 5b. Recreation		rMCZ 26, Hythe Bay
It has not been possible to estimate the value derived from diving in the rMCZ.		
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism 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 unfavourable condition (see Table 1 for details).</p> <p>The coastal path along Hythe affords good wildlife watching opportunities (<a href="#">Freewebs\Folkestonebirds Website</a>), predominantly birds.</p> <p>It has not been possible to estimate the value derived from wildlife watching in the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, all of the features will be recovered to favourable condition.</p> <p>The recovery of the broad scale habitats to favourable condition may improve their functioning as support for fish, bird and marine mammal populations, 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 wildlife watching trips at the national scale.</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.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: Low</p>
<p><b>Other recreation:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The rMCZ lies on a stretch of coastline popular for other recreational activities including kite surfing (<a href="#">Green Traveller Website</a>) and coastal walking with coastal paths available for visitors which loops in front of the bay and along the canal behind (<a href="#">Freewebs\Folkestonebirds</a></p>	<p>If the rMCZ is designated this will provide an additional positive aspect about the location that could be promoted by the tourism and leisure industry and that would be expected to increase visitation rates.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: Low</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5b. Recreation		rMCZ 26, Hythe Bay
<a href="#">Website</a>		
It has not been possible to estimate the value derived from recreation and tourism services in the rMCZ.		

Table 5c. Research and education		rMCZ 26, Hythe Bay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Research:</b> Fletcher and others (2011) 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 formal 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><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>No known education activity occurs in the rMCZ.</p>	<p>Designation may aid the development of additional local (to the rMCZ) education activities (e.g. events, interpretation boards), from which visitors to the site 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: Moderate</p>

Table 5d. Regulating services		rMCZ 26, Hythe Bay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	



Annex I2. Site specific *Impact Assessment materials (Option 2)*

<p><b>Regulation of pollution:</b> The features of the site contribute to the bioremediation of waste (subtidal sediments and mud habitats in deep water) and sequestration of carbon (subtidal sediments) (Fletcher and others, 2011).</p> <p><b>Environmental resilience:</b> The features of the site are not known to contribute to resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011).</p> <p><b>Natural hazard protection:</b> The features of the site are not known to contribute to local flood and storm protection (Fletcher and others, 2011).</p> <p>It has not been possible to estimate the value derived from regulating services associated with the rMCZ.</p>	<p>If the conservation objectives of the features are achieved, all of the features (subtidal mud, mud habitats in deep water and seapens and burrowing megafauna) will be recovered to favourable condition.</p> <p>Recovery of all the features and a potential reduction in the use of bottom towed fishing gear may increase the site's benthic biodiversity and biomass, improving the regulating capacity its habitats.</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.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Low</p>
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Table 5e. Non-use and option values		rMCZ 26, Hythe Bay
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<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 rMCZ and the ecosystem services provided, even if they do not currently benefit from them.</p> <p>It has not been possible to estimate the value derived from non-use and option value services associated with 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 MPAs. 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 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>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

	<p>Examples of these values are shown in (Ranger, Lowe, Sanghera, &amp; Solandt, 2012). Voters in the MCS's 'Your Seas Your Voice' campaign felt that features of the natural environment were strong motivators for reasons why people thought that areas within the rMCZ should be protected, with people frequently attaching value to biodiversity and an area that 'appears unspoilt.' Feelings of emotional attachment to the site were expressed as well. Regarding non-extractive use value, ease of access and proximity considered important as reasons to protect this site. Furthermore, allowing species recovery, particularly fish and shellfish, was perceived as an important management reason to protect the site.</p> <p>Source: Ranger and others. (2011)</p>	
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**rMCZ NG 13a, Aln Estuary****Site area (km<sup>2</sup>): 0.44**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts	rMCZ NG 13a, Aln Estuary
1a. Ecological description	
<p>The part of the Aln Estuary that has been recommended for designation is predominantly coastal saltmarsh and saline reedbed with sheltered muddy gravels and estuarine rocky habitats, all of which are UK Biodiversity Action Plan priority habitats. Estuarine rocky habitats are uncommon on the eastern coast of the UK. Due to the conditions, such as low wave energy, strong tidal effects, freshwater inflow and mobile sediments, biological communities found in estuarine habitats can be diverse and unique.</p> <p>Saltmarshes support a specialist community of halophytic plants that trap and stabilise sediments to form a natural coastal defence. Saltmarsh provides an important habitat for many invertebrates, which are a food source for waterbirds, and provide roost sites at high tide. Birds that have been identified in the area include roosting gulls, dunlin and other waders including redshank, curlew and snipe. The estuary is also identified by stakeholders as a roosting and foraging site for wigeon.</p> <p>The inner part of the Aln Estuary at Coquet supports sprat and flounder nurseries. Juvenile migratory species including plaice, flounder, brown trout, Atlantic salmon, European eel and sand eel have been found close to the estuary; these species may also be utilising the estuary as a spawning and nursery ground.</p> <p>Within the site there is a current habitat creation scheme managed by the Environment Agency as part of the '4shores' intertidal recharge project. The boundaries of recommended Marine Conservation Zone (rMCZ) NG 13a include a field that has been flooded in order to create new saltmarsh habitat.</p> <p>The site overlaps with Alnmouth Saltmarsh Dunes Site of Special Scientific Interest (SSSI) and Northumberland Shore SSSI, and borders rMCZ NG 13.</p> <p>(Net Gain, Final Site Recommendations Submission, 2011)</p>	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

1b. Baseline condition of MCZ features and impact of the rMCZ				
Feature	Area of feature (km <sup>2</sup> )	No. of point records	Baseline	Impact of the MCZ
<b><i>Broad-scale habitats</i></b>				
Coastal saltmarshes and saline reedbeds	0.10	–	Favourable condition	Maintained at favourable condition
High energy infralittoral rock	0.03	–	Favourable condition	Maintained at favourable condition
Intertidal mud	0.10	–	Favourable condition	Maintained at favourable condition
<b><i>Habitats of conservation importance</i></b>				
Estuarine rocky habitats	–	2	Favourable condition	Maintained at favourable condition
Sheltered muddy gravels	–	1	Favourable condition	Maintained at favourable condition
Subtidal sands and gravels	0.12	–	Favourable condition	Maintained at favourable condition
<p><b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>Coastal saltmarshes and saline reedbeds; intertidal mud and Estuarine rocky habitats.</p>				

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

Table 2a. Archaeological heritage	rMCZ NG 13a, AIn Estuary
<b><i>Source of costs of the rMCZ</i></b>	
<p><b>Management scenario 1:</b> 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</p>	

Table 2a. Archaeological heritage		rMCZ NG 13a, Aln Estuary
surveys, diver trails and visitors will be allowed.		
Baseline description of activity	Costs of impact of rMCZ on the sector <i>under Policy Option 1</i>	
<p>English Heritage data include records for a 12th-century chapel and a bronze-age findspot (first discovered in 1858) (English Heritage, pers. comm., 2012).</p> <p>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).</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 depending on the size of the MCZ (English Heritage, pers. comm., 2011). No further impacts on activities related to archaeology are anticipated.</p>	

Table 2b. Ports, harbours, shipping and disposal sites		rMCZ NG 13a, Aln Estuary
<p><b>Source of costs of the rMCZ</b></p> <p><b>Management scenario 1:</b> Not applicable to this site</p> <p><b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to future navigational dredging, disposal of dredge material and port developments. Additional costs incurred in including MCZ features in a new potential Maintenance Dredging Protocol (MDP). It is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed for port developments or port-related activities due to this rMCZ relative to the baseline.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector <i>under Policy Option 1</i>	

Table 2b.Ports, harbours, shipping and disposal sites		rMCZ NG 13a, Aln Estuary							
<p><b>Port development:</b> Within 5km of the rMCZ there are two 2 ports and harbours that may undergo development at some point in the future: Alnmouth and Amble (Ports &amp; Harbours UK website www.ports.org.uk accessed 2012). This may not represent a full list of all ports and harbours impacted by the site.</p> <p><b>Disposal sites:</b> None within 5km of this rMCZ.</p> <p><b>Navigational dredging:</b> None takes place within 5km of this rMCZ.</p>	<table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Cost to the operator</td><td>N/A</td><td>Unknown</td></tr></table>			£m/yr	Scenario 1	Scenario 2	Cost to the operator	N/A	Unknown
	£m/yr	Scenario 1	Scenario 2						
	Cost to the operator	N/A	Unknown						
	<p><b>Scenario 1:</b> Not applicable to this site</p>								
	<p><b>Scenario 2:</b> Future licence applications for known port or harbour development plans or proposals within 5km of this site will be required to consider the potential effects of the activity on the features protected by the rMCZ. Additional costs will be incurred as a result (a breakdown of these by activity is provided in Annex N).</p>								
<p>An additional costs will arise to include MCZ features in a new potential MDP to consider the potential effects of activities on the features protected by the rMCZ. The anticipated additional cost in the MDPs is estimated to be a one-off cost of £8438.</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 NG 13a, AIn Estuary
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Coastal developments (excluding ports and harbours), flood and coastal erosion activities, recreation (recreational boating and fisheries), research and education, and water abstraction, diffuse and pollution\*.

\*The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>28</sup> ✓ = 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 13a, Estuary	NG Aln
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	Ecologica l Importanc e at regional MCZ level	Ecological Importance at wider scale	
A2.3: Intertidal mud	BSH	✓	✓	✓ * 1	None	Maintain		This site contributes over 50% of the total area of this BSH in		

<sup>28</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

								MCZs	
A2.5: Coastal salt marshes	BSH	✓ * 3	✓	✓ * 1	None	Maintain		This site contributes over 50% of the total area of this BSH in MCZs	
A3.1: High Energy infralittoral rock	BSH	✓	✓	✓ * 1	None	Maintain			
Estuarine rocky habitat	FOCI Habitat	✓	✓	✓	None	Maintain			UK BAP
Sheltered muddy gravels	FOCI Habitat	✓	✓	✓	None	Maintain			UK BAP
Subtidal sands and gravels	FOCI Habitat	✓	✓	✓	None	Maintain			UK BAP
<b>Site considerations</b>									
Connectivity			✓						
Geological/Geomorphological features of interest			None						
Appropriate boundary			✓						
Areas of Additional Ecological Importance			✓ * 2, 3						
Overlaps with existing MPAs			✓						

**Additional comments and site benefits:**

<sup>2</sup> The site includes a recently created managed realignment site which is being colonised by salt marsh species.

<sup>3</sup> The existing SSSI is for wintering waders – inclusion of non-designated intertidal habitat will confer protection on adjacent areas which may have value as roosting or foraging sites for SSSI wintering waders.



<sup>1</sup> The site does not reach the minimum viability criteria (5km<sup>2</sup>) for the BSH within the estuary, however the entire estuary unit is contained within the rMCZ, so due to its natural geographic boundary this rMCZ is considered to be viable for all BSHs.

### Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the 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 or human well-being) 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 on definitions can be found in Annex H5.


Table 5a. Fish and shellfish for human consumption		rMCZ NG 13a, AIn Estuary
Baseline	Beneficial impact under Policy Option 1	
<p>No commercial fishing activity is thought to take place within recommended Marine Conservation Zone (rMCZ) NG 13a.</p> <p>The inner part of the AIn Estuary at Coquet supports sprat and flounder nurseries. Juvenile migratory species including plaice, flounder, brown trout and Atlantic salmon have been found close to the estuary mouth, as have European eel and sand eel; these species may also be utilising the estuary as a spawning and nursery ground (Net Gain Final Recommendations, 2011). It has not been possible to estimate the value derived from off-site fisheries as a result of the nursery area function.</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>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No additional management (above that in the baseline situation) of fishing activities is expected. As such, no benefits are expected to accrue as a result of reduced fishing mortality. No change in on-site feature condition is anticipated and therefore no impact on on-site or off-site benefits 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 anthropogenic pressures (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 NG 13a, AIn Estuary
Baseline	Beneficial impact <i>under Policy Option 1</i>	
<p><b>Angling:</b> Fletcher and others (2011) 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 inner part of the AIn Estuary at Coquet supports sprat and flounder nurseries. Juvenile migratory species including plaice, flounder, brown trout, Atlantic salmon, European eel and sand eel have been found close to the estuary; these species may also be utilising the estuary as a spawning and nursery ground (Net Gain Final Recommendations, 2011) and, as such, the estuary is likely to help support potential on-site and off-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>Shore angling is thought to occur within the site but the intensity of the activity is unknown (Stakmap, 2011). It has not been possible to estimate the value derived from angling on-site or the proportion of the value derived from angling off-site which result from the nursery and spawning area.</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>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 impact on on-site or off-site benefits is expected (see Table 4a for further details).</p> <p>Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from anthropogenic pressures (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>
<b>Diving:</b> Diving and snorkelling are not thought to take place within the rMCZ.	N/A	N/A


Table 5b. Recreation	rMCZ NG 13a, AIn Estuary
<p><b>Wildlife watching:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.</p> <p>The site is popular for wildlife enthusiasts, particularly bird watchers. The saltmarsh is an important haven for wading birds and wildfowl when the tide covers the mudflats upon which they feed. It also provides an important habitat for many invertebrates, which are themselves a food source to many species of birds, as well as grazing opportunities to species such as wigeon. Birds that have been identified in the area include roosting gulls, dunlin and other waders including redshank, curlew and snipe. The estuary is also identified by stakeholders as a roost site for wigeon. A current habitat creation scheme is managed by the Environment Agency as part of the “4shores” intertidal recharge project to create new saltmarsh habitat. The boundaries of rMCZ NG 13a account for this and include a field that has been flooded and saltmarsh habitat established (Net Gain Final Recommendations, 2011).</p> <p>It has not been possible to estimate the value derived from wildlife watching in the rMCZ.</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>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 anthropogenic pressures (because if necessary, mitigation would be introduced, with the associated costs and benefits).</p> <p>Anticipated direction of change:</p>  <p>Confidence: Moderate</p>

Table 5c. Research and education		rMCZ NG 13a, Aln Estuary
Baseline	Beneficial impact under Policy Option 1	
<p><b>Research:</b> Fletcher and others (2011) 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 site overlaps with the Alnmouth Saltmarsh and Dunes Site of Special Scientific Interest (SSSI) and the Northumberland Shore SSSI (Net Gain Final Recommendations, 2011). and, as such, ecological monitoring activities are ongoing. 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 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><b>Education:</b> Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.</p> <p>The extent of current educational activity carried out in the site is unknown. It has not been possible to estimate the value derived from education activities associated with the rMCZ.</p>	<p>Designation may aid additional local (to the rMCZ) provision of education (e.g. events and interpretation boards), from which visitors would derive benefit.</p> <p>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 NG 13a, Aln Estuary
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Table 5d. Regulating services		rMCZ NG 13a, AIn Estuary
Baseline	Beneficial impact under Policy Option 1	
<p><b>Regulation of pollution:</b> The features of the site contribute to the bioremediation of waste and sequestration of carbon. It has not been possible to estimate the value derived from the regulation of pollution in the rMCZ.</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems. It has not been possible to estimate the value derived from environmental resilience in the rMCZ.</p> <p><b>Natural hazard protection:</b> The features of the site contribute to local flood and storm protection. It has not been possible to estimate the value derived from natural hazard protection in the rMCZ.</p> <p>(Fletcher and others, 2011)</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 regulatory capacity of the site 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 anthropogenic pressures (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 5e. Non-use and option values		rMCZ NG 13a, AIn 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.	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	<p>Anticipated direction of change:</p> <p></p>

Table 5e. Non-use and option values		rMCZ NG 13a, AIn Estuary
	(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.	Confidence: Moderate

**rMCZ NG 15, Rock Unique****Site area (km<sup>2</sup>): 492.07**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

Table 1. Conservation impacts	rMCZ NG 15, Rock Unique
<b>1a. Ecological description</b>	
<p>The sea bed of recommended Marine Conservation Zone (rMCZ) NG 15 is composed of rock, coarse sediment and sand and contains the only example of low energy circalittoral rock in the Net Gain Project Area. This habitat is extremely rare around the UK, with a few examples being found in the Scottish lochs and a few isolated sites around the south-west of England and the west coast of Ireland. Due to the low energy associated with this rocky habitat and the depth at which it occurs, a unique animal community is able to persist. With areas too deep for algae to obtain the light they need to grow, animal communities of sea squirt, dead man's fingers and plumose anemone are able to proliferate as well as peacock worm, bristleworm, squat lobster, hermit crab and a number of species of urchin.</p> <p>The seabed in the site is composed of subtidal sands and gravels habitat, which are identified as a priority habitat in the UK Biodiversity Action Plan (BAP). Coarse sediment habitats are characterised by worms and mobile crustaceans, such as squat lobster, bivalve molluscs and a number of species of sea cucumber. Sandy sea beds further offshore are not usually disturbed by waves and tides in the same way that inshore areas are and so are able to support worm, mollusc and amphipod within them.</p> <p>Cetacean sightings for this area include year-round sightings of white-beaked dolphin, along with harbour porpoise (listed in Annex 2 of the EC Habitats</p>	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Directive), minke whale and humpback whale, all of which are Marine Biodiversity Action Plan species in the UK. Sightings in the area coupled with information on foraging distances of grey seal suggest that this site could be used by the grey seal population present on the Farne Islands. The grey seal is listed in Annex 2 of the E Habitats Directive and is named in the Northumberland BAP.

The site supports high densities of foraging birds in the winter, and moderate densities during the summer, including guillemot, kittiwake and puffin. Foraging ranges of these birds suggest that these birds from the Farne Islands could use this area for feeding.

There are no existing Marine Protected Areas within or adjacent to the site.

(Net Gain, Final Site Recommendations Submission, 2011)

**1b. Baseline condition of MCZ features and impact of the rMCZ**

Feature	Area of feature (km <sup>2</sup> )	No. of point records	Baseline	Impact of the MCZ
<b><i>Broad-scale habitats</i></b>				
Low energy circalittoral rock	20.34	–	Favourable condition	Maintained at favourable condition
Subtidal coarse sediment	161.26	–	Favourable condition	Maintained at favourable condition
Subtidal sand	309.22	–	Favourable condition	Maintained at favourable condition
<b><i>Habitats of conservation importance</i></b>				
Subtidal sands and gravels	322.68 (modelled)	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 NG 15, Rock Unique
<b>Source of costs of the rMCZ</b>  <b>Management scenario 1:</b> Mitigation of impacts of Ministry of Defence 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. The Ministry of Defence 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 <i>under Policy Option 1 and Policy Option 2</i>
The Ministry of Defence is known to make use of the site for military practice, by the Air Force Department for aerial activity which does not involve the release of weapons, and as a firing danger area.		It is not known whether this rMCZ will impact on the Ministry of Defence's use of the site. Impacts of rMCZs on the Ministry of Defence's activities are assessed in the Evidence Base and Annex N9.

### 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 <i>under Policy Option 1 and Policy Option 2</i> (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ NG 15, Rock Unique
Cables (existing interconnectors and telecom cables), commercial fisheries and shipping (transit of vessels only).	

### Contribution to Ecological Network Guidance



Annex I2. Site specific *Impact Assessment materials (Option 2)*

<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 scale<sup>29</sup></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>									
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	Ecological Importance at regional MCZ level	Ecological Importance at wider scale
Subtidal sands and gravels	FOCI	✓	✓	✓	None	Maintain			BAP habitat
4.3 Low energy circalittoral rock * 1	BSH	✓ * 2	✓	✓	None	Maintain	Out of all of the rMCZs and existing MPAs, this site contributes the largest and only area of low energy circalittoral rock. This site makes a significant contribution towards meeting the lower level adequacy and	Only site proposed for this feature within the region. This feature is not protected within existing MPAs. This feature has limited distribution.	This feature has limited distribution in the whole MCZ project area. This feature is not protected within existing MPAs in the Northern North Sea Regional Sea.

<sup>29</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

							replication guidelines for this feature within the regional MCZ project area.		
A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Maintain			
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Maintain			
<b>Site considerations</b>									
Connectivity					✓ * 3				
Geological/Geomorphological features of interest					✓ * 4				
Appropriate boundary					✓				
Areas of additional ecological importance					✓ <sup>5</sup>				
Overlaps with existing MPAs					None				

**Additional comments and site benefits:**

- <sup>1</sup> Low energy circalittoral rock has been proposed as a feature for designation, however there is some uncertainty surrounding its presence, following recent survey work. However as the data are yet to be fully analysed we have continued to consider it in the assessment of this feature in relation to the ENG guidelines (see Section 5.1 of JNCC and Natural England's Advice on recommended Marine Conservation Zones).
- <sup>2</sup> Low energy circalittoral rock is not present in any existing MPAs in this regional MCZ project area and has limited distribution in the MCZ project area as a whole. The feature is only present in Rock Unique rMCZ, and therefore there is no scope to replicate the designation of this feature in this regional MCZ project.
- <sup>3</sup> Connectivity for European Nature Information System (EUNIS) level 2 circalittoral rock was achieved within this regional MCZ project as far as is possible due to the habitat distribution. This site is within the suggested distance of 80km from its nearest neighbour containing these habitats and also contributes to achieving connectivity for the EUNIS Level 2 sublittoral sediment habitat.
- <sup>4</sup> The site is not put forward specifically for geological/geomorphological features, but it contains depositional glacial features and the topographic feature of the North-East Bank seabed mound or pinnacle.

- <sup>5</sup> 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 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 or human well-being) 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 on definitions can be found in Annex H5.


Table 5a. Fish and shellfish for human consumption		rMCZ NG 15, Rock Unique
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p>Fletcher and others (2011) 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.</p> <p>Commercial fishing occurs within the rMCZ by UK under and over 15 metre vessels. Estimated total value of landings by UK vessels is £0.372m/yr. The vast majority of this value can be attributed to vessels using mid-water trawls (£0.368m/yr) and bottom trawls (£0.004m/yr). The rest can be attributed to vessels using pots and traps (&lt;£0.001m/yr) (MCZ Fisheries Model, 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 condition.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No additional management (above that in the baseline situation) of fishing activities is expected. As such, no benefits are expected to accrue as a result of reduced fishing mortality. No change in on-site feature condition is anticipated and therefore no impact on on-site or off-site benefits 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 anthropogenic pressures (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 NG 15, Rock Unique
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5b. Recreation		rMCZ NG 15, Rock Unique
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 NG 15, Rock Unique
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<b>Research:</b> Research is not known to take place in the recommended Marine Conservation Zone (rMCZ).	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change:  Confidence: High
<b>Education:</b> Education is not known to take place in the rMCZ.	As the rMCZ is more than 6nm offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.  Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change:  Confidence: Low


Table 5d. Regulating services		rMCZ NG 15, Rock Unique
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> The features of the site contribute to the bioremediation of waste and sequestration of carbon. It has not been possible to estimate the value derived from the regulation of pollution in the rMCZ.</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems. It has not been possible to estimate the value derived from environmental resilience in the rMCZ.</p> <p><b>Natural hazard protection:</b> As the site is offshore, its features are not thought to contribute to the delivery of this service.</p> <p>(Fletcher and others, 2011)</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 regulatory capacity of the site 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 anthropogenic pressures (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 5e. Non-use and option values		rMCZ NG 15, Rock Unique
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
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.	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	<p>Anticipated direction of change:</p> <p></p>

Table 5e. Non-use and option values		rMCZ NG 15, Rock Unique
	(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.	Confidence: Moderate

**rMCZ NG 16, Swallow Sand****Site area (km<sup>2</sup>): 4,746.12**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, draft conservation objectives for some features have been changed from those established by the Regional Sea Projects. These changes and their impacts on management and costs are reflected under Policy Option 2

Table 1. Conservation impacts	rMCZ NG 16, Swallow Sand
<b>1a. Ecological description</b>	
<p>The sea bed of recommended Marine Conservation Zone (rMCZ) NG 16 is composed of subtidal coarse sediment, sand and gravels. Due to the depth of the site, the sea bed is likely to be subject to low tidal stress, and as a result the sediment could provide a stable habitat supporting a diverse range of marine flora and fauna. Subtidal coarse sediments such as these are likely to include communities of anemone, worm, mollusc, sea urchin and both mobile and sessile epifauna. Sand and gravel habitats in the North Sea are often characterised by the presence of Venus bivalve communities. Sandy habitats are likely to be characterised by the thin-shelled bivalve mollusc <i>Fabulina fabula</i>, polychaetes, sand hopper and worm.</p> <p>The site also contains Swallow Hole, an example of a North Sea glacial tunnel valley believed to relate to the Devensian/Weichselian glaciations. Muddier habitats tend to occur in areas that have relative shelter from wave and tidal pressure, such as deeps. Polychaetes, brittle star and bivalve mollusc often</p>	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

dominate this muddier sediment type. There is an indication that the north-eastern portion of the site is an important area for summer foraging birds, such as Atlantic puffin, black kittiwake, common guillemot, northern fulmar and northern gannet.

There are no existing Marine Protected Areas within or adjacent to the site.

(Net Gain, Final Site Recommendations Submission, 2011)

<b>1b. Baseline condition of MCZ features and impact of the rMCZ</b>				
<b>Feature</b>	<b>Area of feature (km<sup>2</sup>)</b>	<b>No. of point records</b>	<b>Baseline</b>	<b>Impact of the MCZ</b>
<b><i>Broad-scale habitats</i></b>				
Subtidal coarse sediment	293.26	–	Favourable condition	Maintained at favourable condition
Subtidal sand	4,451.67	–	Favourable condition	Maintained at favourable condition
<b>SNCB advice recommends that the conservation objective for Subtidal sand is changed from “Maintain” to “Recover”. Therefore Option 2 uses the conservation objective “Recover to favourable condition” for this feature</b>				
<b><i>Habitats of conservation importance</i></b>				
Subtidal sands and gravels	4,496.92 (modelled)	3	Favourable condition	Maintained at favourable condition
<b>SNCB advice recommends that the conservation objective for Subtidal sands and gravels is changed from “Maintain” to “Recover”. Therefore Option 2 uses the conservation objective “Recover to favourable condition” for this feature</b>				
<b><i>Geological and geomorphological features of interest</i></b>				
North Sea glacial tunnel valleys (Swallow Hole)	18.44	–	Favourable condition	Maintained at favourable condition
<p>This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>Subtidal coarse sediment and North Sea glacial tunnel valleys (Swallow hole)</p>				

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

<b>Table 2a. National defence</b>		<b>rMCZ NG 16, Swallow Sand</b>
<b>Source of costs of the rMCZ</b>  <b>Management scenario 1:</b> Mitigation of impacts of Ministry of Defence 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. The Ministry of Defence will also incur costs in revising environmental tools and charts to include MCZs.		
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector <i>under Policy Option 1 and Policy Option 2</i></b>	
The Ministry of Defence is known to make use of the site for military practice, by the Air Force Department for aerial activity that does not involve the release of weapons, and the site is a firing danger area.	It is not known whether this rMCZ will impact on the Ministry of Defence's use of the site. Impacts of rMCZs on the Ministry of Defence's activities are assessed in the Evidence Base and Annex N9.	

<b>Table 2b. Other impacts that are assessed for the suite of MCZs and not for this site alone</b>	<b>rMCZ NG 16, Swallow Sand</b>
<b>Cables (interconnectors and telecom cables)</b>  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).	
<b>Oil and gas related activities (including carbon capture and storage)</b>  This rMCZ overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licenced 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 H11 and Annex N10 (they are not assessed for this site alone).	



Table 2c: Commercial fisheries		rMCZ NG 16, Swallow Sand		
<b>Source of costs of the rMCZ Policy Option 2</b>				
<b>Policy Option 1</b>				
No management anticipated, based on the Regional Project draft Conservation Objectives (and therefore no costs are anticipated).				
<b>Policy Option 2</b>				
SNCB Advice [insert reference] recommends that the conservation objectives for subtidal sand and subtidal sands and gravels are changed from “Maintain” to “Recover to favourable condition”. This may require management measures for commercial fisheries in Option 2 above those assumed for Option 1 (the Regional Project recommendations)				
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. Two scenarios have been employed in the Impact Assessment (IA) for these fisheries in order to reflect this uncertainty: open to certain gear types and closure of the fishery within the site. Should the site be designated, the management that will be required will fall somewhere within this range.				
<b>Management scenario 1:</b> No additional management				
<b>Management scenario 2:</b> Closure of entire rMCZ to bottom trawls and dredges				
<b>Summary of all fisheries:</b> Estimated annual value of landings from the rMCZ: £0.376m/yr (MCZ Fisheries Model).				
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries <i>under Policy Option 2</i>		
<b>Bottom trawls:</b> Number of vessels unknown.		Estimated annual value of UK vessel landings affected:		
Estimated total value of landings from the rMCZ: £0.188m/yr (MCZ Fisheries Model).		£m/yr	Scenario 1	Scenario 2
		Value of landings affected	0.000	0.188
<b>Dredges:</b> Number of vessels unknown.		Estimated annual value of UK vessel landings affected:		

Table 2c: Commercial fisheries		rMCZ NG 16, Swallow Sand		
Estimated total value of landings from the rMCZ: £0.000m/yr (MCZ Fisheries Model).	£m/yr	Scenario 1	Scenario 2	
	Value of landings affected	0.000	0.000	
Total direct impact on UK commercial fisheries <i>under Policy Option 2</i>				
	Estimated annual value of UK vessel landings and gross value added (GVA) affected:			
	£m/yr	Scenario 1	Scenario 2	Best Estimate
	Value of landings affected	0.000	0.188	0.024
	GVA affected	0.000	0.070	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.			
Baseline description of non-UK fisheries		Costs of impact of rMCZ on non-UK commercial fisheries		
		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 <i>under Policy Option 1 and Policy Option 2</i>	rMCZ NG 16, Swallow Sand
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**(existing activities at their current levels and future proposals known to the regional MCZ projects)**

Shipping (transit of vessels only).

**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 scale<sup>30</sup></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 NG 16, Swallow Sand
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
Subtidal sands and gravels	FOCI	✓	✓	✓	None	<i>Maintain</i>			BAP habitat
A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Maintain		Out of all of the rMCZs, this site contributes the second largest area of subtidal coarse sediment	

<sup>30</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

A5.2 Subtidal sand	BSH	✓	✓	✓	None	<i>Maintain</i>		Out of all of the rMCZs, this site contributes the largest area of subtidal sands	Out of all of the rMCZs, this site contributes the largest area of subtidal sands in the whole MCZ project area
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Site considerations	
Connectivity	✓
Geological/Geomorphological features of interest	Glacial Process features: North Sea glacial tunnel valleys (Swallow Hole) * <sup>1</sup>
Appropriate boundary	✓
Areas of additional ecological importance	✓ * <sup>2</sup>
Overlaps with existing MPAs	None

**Additional comments and site benefits:**

- <sup>1</sup> The site is proposed for designation for Glacial Process features, in particular, North Sea glacial tunnel valleys (Swallow Hole). The site also includes some geomorphological features such as the East Bank Ridges tidal bank, and some transverse bedforms.
- <sup>2</sup> 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 Marine Conservation zones for more detail on these).
- Arctica islandica* was not proposed as a feature for designation within this rMCZ, but there is evidence to indicate that this species may be present in this site. If the presence of this feature was verified it could be put forward as a feature for designation in order to meet the lower level target for replication in this regional MCZ project. There is potential for other sites within the Northern North Seas biogeographic region to contain replicates of this feature, as *Arctica islandica* is a MPA search feature for the Scottish MPA project.

**Anticipated benefits to ecosystem services**

The habitats, species and other ecological features of the 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 or human well-being) 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 on definitions can be found in Annex H5.

Table 5a. Fish and shellfish for human consumption		rMCZ NG 16, Swallow Sand
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	


Table 5a. Fish and shellfish for human consumption		rMCZ NG 16, Swallow Sand
<p>Fletcher and others (2011) 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.</p> <p>Commercial fishing occurs within the rMCZ by UK under and over 15 metre vessels. Estimated total value of landings by UK vessels is £0.188m/yr, which can be attributed entirely to vessels using bottom trawls within the site (MCZ Fisheries Model, 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 condition.</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.</p> <p>No additional management (above that in the baseline situation) of fishing activities is expected. As such, no benefits are expected to accrue as a result of reduced fishing mortality. No change in on-site feature condition is anticipated and therefore no impact on on-site or off-site benefits 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 anthropogenic pressures (because if necessary, mitigation would be introduced, with the associated costs and benefits).</p>	<p>Anticipated direction of change:</p> <div></div> <p>Confidence: Moderate</p>
	<p><b>Possible changes in beneficial impacts under Option 2 due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective of “recover” is more appropriate than “maintain” for subtidal sand and subtidal sand and gravels. This means that if the conservation objectives of features in this site are achieved, then subtidal sand and subtidal sand and gravels will be recovered to favourable condition while other features will be maintained at favourable condition.</p> <p>The achievement of conservation objectives of features in this site could improve the status of the habitats of commercial fish species in the area. This in turn could support the population of of these species, which can improve the provision of this ecosystem service. However, the degree of this improvement</p>	

Table 5a. Fish and shellfish for human consumption		rMCZ NG 16, Swallow Sand
	or whether there will be any improvements is currently unknown.	

Table 5b. Recreation		rMCZ NG 16, Swallow Sand
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>	
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 NG 16, Swallow Sand
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>	
<b>Research:</b> Research is not known to take place in the recommended Marine Conservation Zone (rMCZ).	Monitoring of the rMCZ will help to inform understanding of how the marine environment is changing and is impacted on by anthropogenic pressures and management interventions. Other research benefits are unknown.	Anticipated direction of change:   Confidence: High

Table 5c. Research and education	rMCZ NG 16, Swallow Sand
	<p><b>Possible changes in impacts under Option 2 due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective of “recover” is more appropriate than “maintain” for subtidal sand and subtidal sand and gravels. This means that if the conservation objectives of features in this site are achieved, then subtidal sand and subtidal sand and gravels will be recovered to favourable condition while other features will be maintained at favourable condition.</p> <p>It is not clear whether the achievement of the conservation objectives of the features in this site will change the provision of this particular ecosystem service.</p>




Table 5c. Research and education		rMCZ NG 16, Swallow Sand
<b>Education:</b> Education is not known to take place in the rMCZ.	<p>As the rMCZ is more than 6nm offshore and therefore relatively inaccessible, no benefits are likely to arise from direct use of the site for education.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: Low</p>
	<p>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><b>Possible changes in impacts under Option 2 due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective of “recover” is more appropriate than “maintain” for subtidal sand and subtidal sand and gravels. This means that if the conservation objectives of features in this site are achieved, then subtidal sand and subtidal sand and gravels will be recovered to favourable condition while other features will be maintained at favourable condition.</p> <p>It is not clear whether the achievement of the conservation objectives of the features in this site will change the provision of this particular ecosystem service.</p>	

Table 5d. Regulating services		rMCZ NG 16, Swallow Sand
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>	


Table 5d. Regulating services	rMCZ NG 16, Swallow Sand
<p><b>Regulation of pollution:</b> The features of the site contribute to the bioremediation of waste and sequestration of carbon. It has not been possible to estimate the value derived from the regulation of pollution in the rMCZ.</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems. It has not been possible to estimate the value derived from environmental resilience in the rMCZ.</p> <p><b>Natural hazard protection:</b> As the site is offshore, its features are not thought to contribute to the delivery of this service.</p> <p>(Fletcher and others, 2011)</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 regulatory capacity of the site 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 anthropogenic pressures (because if necessary, mitigation would be introduced, with the associated costs and benefits).</p> <p><b>Possible changes in beneficial impacts due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective of “recover” is more appropriate than “maintain” for subtidal sand and subtidal sand and gravels. This means that if the conservation objectives of features in this site are achieved, then subtidal sand and subtidal sand and gravels will be recovered to favourable condition while other features will be maintained at favourable condition.</p> <p>Features of this site contribute to the bioremediation of waste, the sequestration of carbon, and to the resilience and continued regeneration of marine ecosystems. If the conservation objectives are achieved, there could be an improvement in the provision of this ecosystem service. However, the degree of this improvement and whether there</p> <p>Anticipated direction of change:</p>  <p>Confidence: Moderate</p>

Table 5d. Regulating services		rMCZ NG 16, Swallow Sand
	will indeed be an improvement is currently unknown.	


Table 5e. Non-use and option values		rMCZ NG 16, Swallow Sand
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>	
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.	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 protect both the features and their option to benefit from the services in the future from the risk of future degradation.	<p>Anticipated direction of change:</p>  <p>Confidence: Moderate</p>
	<p><b>Possible changes in beneficial impacts due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective of “recover” is more appropriate than “maintain” for subtidal sand and subtidal sand and gravels. This means that if the conservation objectives of features in this site are achieved, then subtidal sand and subtidal sand and gravels will be recovered to</p>	

Table 5e. Non-use and option values		rMCZ NG 16, Swallow Sand
	<p>favourable condition while other features will be maintained at favourable condition.</p> <p>It is not clear whether the achievement of the conservation objectives of the features in this site will change the provision of this particular ecosystem service.</p>	

### Recommended Marine Conservation Zone (rMCZ) 5, North of Celtic Deep

Site area (km<sup>2</sup>): 655.69

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

**Table 1. Site-specific benefits arising from the rMCZ (over 2013 to 2032 inclusive)**

Table 1. Conservation impacts	rMCZ 5, North of Celtic Deep
<b>1a. Ecological description</b>	
<p>This site is a large offshore area located between Welsh territorial waters and Irish offshore waters. It is the most southerly site in the ISCZ Project Area, located 23km from the Welsh coast. Extensive areas of subtidal coarse sediment are present throughout the site in addition to subtidal sand and moderate energy rocky habitat. The site includes part of St George's Channel, which is a deep (c.112 metres) area that connects the Irish Sea to the Celtic Sea and through which water enters the Irish Sea from the Atlantic Ocean. The area is associated with high benthic diversity (Bolam and others (2010) in ISCZ 2011) and high pelagic biological productivity due to thermal fronts that form in the summer months (Miller and others (2010) in ISCZ, 2011). The associated increase in abundance of pelagic food attracts top predators; the area is critical to the common dolphin (Clark and others (2010) in ISCZ, 2011) and is an important sea bird foraging area (Smith and others (2011) in ISCZ, 2011). Gannets <i>Morus bassanus</i>, Manx shearwaters <i>Puffinus puffinus</i> and puffins <i>Fratercula arctica</i> are likely to forage in the area and originate from Welsh and Irish colonies, in particular Cardigan Bay and the rocky cliffs on the east coast of Ireland (RSPB, pers comm., 2011). Gannets feed on mackerel, herring and sand eels; Manx shearwaters feed on herrings, sprats, whitebait and pilchards; and puffins feed on sand eels and capelins (RSPB, pers comm., 2011). The large numbers of sand eels <i>Ammodytes</i> spp. present in sandy sediment attract sea birds such as puffins, razorbills, guillemots and terns. This habitat type is an important area for crabs and other epifauna, in particular echinoderms. Hermit crabs</p>	

*Pagurus bernhardus*, the swimming crab *Liocarcinus depurator* and the edible crab *Cancer pagurus* feed on prey in this habitat (Jones, Hiscock & Connor (2000) in Fletcher and others (2012)).

Basking sharks *Cetorhinus maximus* are now marked as endangered on the International Union for Conservation of Nature (IUCN) red list of threatened species. St George's Channel is a key part of their migratory route, utilising the nutrient-rich waters formed by tidal mixing currents (Stephan and others (2011) in ISCZ, 2011). Molluscs and annelids (for example, bivalves and worms) along with crustaceans are the main secondary producers around the area of rMCZ five (Bolam and others (2010) in ISCZ, 2011), which means these marine animals are important for recycling organic matter from within the sediment and are key in linking energy between primary production in the plankton with predatory fish (Bolam and others (2010) in ISCZ, 2011). The ocean quahog *Arctica islandica* has been recorded within rMCZ five (Mackie (1995) in ISCZ, 2011). The only known breeding population of quahogs in the Irish Sea is located much further north (in rMCZ 6), as the warmer sea water temperatures in recent years may not favour larval survival in the southern Irish Sea (P. Butler, pers comm., 2011). However, given the longevity of the species and its importance as a scientific reference tool, the ocean quahog is noted as being present but not designated in this southerly site, rMCZ 5. There are records for horse mussels *Modiolus modiolus*, a feature which has not proposed for designation in this site. The records within rMCZ five are likely to be scattered populations of adults, records of juveniles, or another *modiolus* species (Rees (2005) in ISCZ, 2011). Source: ISCZ (2011).

1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km <sup>2</sup> )	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
Moderate Energy Circalittoral Rock	2.33	-	Favourable condition	Maintain at favourable condition
Subtidal Coarse Sediment	616.83	-	Unfavourable condition	Recover to favourable condition
Subtidal Sands	32.62	-	Unfavourable condition	Recover to favourable condition
<i>Habitats of Conservation Importance</i>				
Subtidal Sands and Gravels	599.86	3	Unfavourable condition	Recover to favourable condition
<p><b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>Subtidal coarse sediment and subtidal sands and gravels.</p>				

**Table 2. Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)**

Table 2a. Commercial fisheries	rMCZ 5, North of Celtic Deep
Source of costs of the rMCZ	

Table 2a. Commercial fisheries		rMCZ 5, North of Celtic Deep										
<p>The Joint Nature Conservation Committee (JNCC) and Natural England have advised that there is considerable uncertainty about whether additional management of bottom trawling, dredging, nets, hooks and lines will be required for certain features potentially protected by the rMCZ. Therefore, two scenarios have been employed in the Impact Assessment (IA) for these fisheries to reflect this uncertainty: no additional management, and closure of the fishery within the site. Should the site be designated, the management required will fall somewhere within this range.</p> <p><b>Management scenario 1:</b> Entire rMCZ is open to all gear types.</p> <p><b>Management scenario 2:</b>* Closure of entire rMCZ to bottom trawls.</p> <p><b>Management scenario 3:</b> Closure of entire rMCZ to bottom trawls, dredges, nets, and hooks and lines.</p> <p>* This is the management scenario identified by the vulnerability assessment using information collected from stakeholders.</p>												
<p><b>Summary of all UK commercial fisheries:</b> The site lies completely the 12 nautical miles (nm) limit . A number of commercial fishing restrictions are already in existence (listed in Annex E). Relatively speaking, very little UK fishing activity is known to take place in the site. Of approximately 700 UK vessels that are known to be active in the Irish Sea Conservation Zones (ISCZ) Project Area, fewer than 5 UK vessels are known to fish in the site (both under and over 15 metre vessels) (ISCZ, 2010). These use dredges, long lines and gill nets and are Scottish and Welsh vessels (ISCZ, 2010). Discussions at stakeholder meetings indicated that UK fishing activity in the site is very low (Stakeholder Focus Meeting, 2011). Vessel Monitoring System (VMS) data suggest that bottom trawls, nets, and hooks and lines are used by over 15 metre UK vessels in the site but that effort is very low. There is no evidence for the use of pots and traps or mid-water trawls in the site. The site is mostly fished by non-UK vessels (see below).</p> <p>The estimated total value of UK landings from the site is &lt;£0.001m/yr.</p>												
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries <i>under Policy Option 1 and Policy Option 2</i>										
<p><b>Bottom trawls:</b> VMS data indicates that bottom trawling by over 15 metre UK vessels takes place in this site (MMO, 2011a). Stakeholder meetings gave no indication of how many vessels are active in the site but suggested that the number was low (Stakeholder Focus Meeting, 2011). The estimated value of landings from the site is &lt;£0.001m/yr.</p>		<p>The annual value of UK landings affected is estimated 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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>&lt;0.001</td><td>&lt;0.001</td></tr></table> <p>Stakeholders have not provided a description of impact.</p>			£m/yr	Scenario 1	Scenario 2	Scenario 3	Value of landings affected	0.000	<0.001	<0.001
£m/yr	Scenario 1	Scenario 2	Scenario 3									
Value of landings affected	0.000	<0.001	<0.001									
<p><b>Dredges:</b> Fewer than 5 UK vessels are known to dredge in the site (ISCZ, 2010). Stakeholder meetings gave no indication of how many vessels are active in the site but suggested that the number was low (Stakeholder Focus Meeting, 2011). VMS data does not indicate the use of dredges by over 15 metre UK vessels in the site (MMO, 2011a). The estimated value of landings from the site is &lt;£0.001m/yr.</p>		<p>The annual value of UK landings affected is estimated 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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>&lt;0.001</td></tr></table> <p>Stakeholders have not provided a description of impact.</p>			£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									
<p><b>Nets:</b> Fewer than 5 UK vessels are known to use nets in the site (ISCZ, 2010). They are Welsh vessels using gill nets to target pollack. VMS data indicate the use of nets by over 15 metre UK vessels in the site (MMO,</p>		<p>The annual value of UK landings affected is estimated 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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.000</td><td>&lt;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									

Table 2a. Commercial fisheries		rMCZ 5, North of Celtic Deep															
2011a). Discussions at stakeholder meetings indicated that the level of UK fishing activity in the site is very low (Stakeholder Focus Meeting, 2011). The estimated value of landings from the site is <£0.001m/yr.		Stakeholders have not provided a description of impact.															
<b>Hooks and lines:</b> Fewer than 5 vessels are known to use nets in this site. They are Welsh vessels, using long lines to target spurdog, catfish, dogfish and thornback ray throughout the year (ISCZ, 2010). Discussions at stakeholder meetings indicated that UK fishing activity in the site is very low (Stakeholder Focus Meeting, 2011). VMS data indicate that hooks and lines are used by over 15 metre UK vessels in the site (MMO, 2011a). The estimated value of landings from the site is <£0.001m/yr.		The annual value of UK landings affected is estimated 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>&lt;0.001</td></tr></table> Stakeholders have not provided a description of impact.				£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														
Total direct impact on UK commercial fisheries under Policy Option 1 and Policy Option 2																	
		The annual value of UK landings and gross value added (GVA) affected is estimated 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>&lt;0.001</td><td>&lt;0.001</td></tr><tr><td>GVA affected</td><td>0.000</td><td>&lt;0.001</td><td>&lt;0.001</td></tr></table> <p>The best estimate is based on an assumption on the likelihood of the lowest and highest cost scneario 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>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 overestimate for this site.</p> <p>Fewer than 5 vessels are known to fish in the site using hooks and lines, dredges and nets (ISCZ, 2010). VMS data indicate that bottom trawls, nets, and hooks and lines are used in the site. Discussions at stakeholder meetings indicated that UK fishing activity in the site is very low</p>				£m/yr	Scenario 1	Scenario 2	Best estimate	Value of landings affected	0.000	<0.001	<0.001	GVA affected	0.000	<0.001	<0.001
£m/yr	Scenario 1	Scenario 2	Best estimate														
Value of landings affected	0.000	<0.001	<0.001														
GVA affected	0.000	<0.001	<0.001														

Table 2a. Commercial fisheries	rMCZ 5, North of Celtic Deep
	<p>(Stakeholder Focus Meeting, 2011). Some vessels fishing in the site use more than one gear type. Where there is evidence of this (from Fisherman or MMO (2011b)), duplication has been removed so that the number below represents the minimum number of vessels fishing in the site impacted under each scenario: Scenario 1: 0 Scenario 2: &lt; 5 Scenario 3: &lt; 5</p>
Baseline description of non-UK fisheries	Costs of impact of rMCZ on non-UK commercial fisheries under Policy Option 1 and Policy Option 2
<p>VMS data indicate that Belgian, Spanish and French bottom trawlers and Belgian beam trawlers fish (all over 15 metre vessels) fish in the site (MMO, 2011a). There are usually no more than three Belgian beam trawlers in the entire Irish Sea at one time but, a total of about eight visit the Irish Sea. (Belgian Fisheries Representative, 2011). The Belgian vessels visit the Irish Sea from October to April. The estimated value of French landings from the site is £0.021m/yr for mobile gear (Direction des Pêches Maritimes et de l' Aquaculture, 2011).</p>	<p><b>Comments from representatives of Belgian fisheries:</b> Regarding Scenarios 2 and 3: In the view of Belgian fisheries representatives, the proposed restrictions would be a financial 'disaster' for the Belgian fleet and they anticipate that eight Belgian vessels that currently fish in the Irish Sea would be forced to leave the fishing industry. Displacement of effort of Belgian vessels that fish in the site will increase the concentration of vessels into smaller areas, which will increase competition. If fishing grounds are reduced in area, it is anticipated that fishing quota will also be restricted with significant financial repercussions for the Belgian fishing fleet. The Belgian fleet is gradually adopting a new gear type, the Sumwing, which is a lighter gear and impacts the sea bed less. However, if this gear type is prohibited also in the rMCZ, there would be no alternative but for the Belgian vessels to stop fishing in the Irish Sea and potentially stop fishing altogether. It is not feasible for Belgian vessels to adapt to pots and traps to fish in the Irish Sea. (Belgian Fisheries Representative, 2011). Quantitative estimates of impact are not available.</p> <p>The Spanish and French fleets have not provided a description of impact. Quantitative estimates of impact are not available for the Spanish and Belgian fleet. The impact on the French fleet is estimated to be a loss in value of landings of £0.021m/yr for mobile gear (Direction des Pêches Maritimes et de l' Aquaculture, 2011). However, no breakdown of this estimate is available by gear and so it may include the value of landings from mobile gear other than bottom trawling which would not be affected.</p>

Table 2b. National defence	rMCZ 5, North of Celtic Deep
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<b>Source of costs of the rMCZ</b>	
<b>Management scenario 1:</b> Mitigation of impacts of Ministry of Defence 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. The Ministry of Defence will also incur costs in revising environmental tools and charts to include MCZs.	
<b>Baseline description of activity</b>	<b>Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2</b>
The Ministry of Defence is known to make use of the whole site as a firing range.	It is not known whether this rMCZ will impact on the Ministry of Defence's use of the site. However, the impact on the UK economy is not likely to be significant. Impacts of rMCZs on the Ministry of Defence's activities are assessed in Annex J.

<b>Table 2c. Other impacts that are assessed for the suite of MCZs and not for this site alone</b>	<b>rMCZ 5, North of Celtic Deep</b>
<b>Oil and gas related activities (including carbon capture and storage)</b>	
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).	

**Table 3. Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)**

<b>Table 3. Human activities in the site that are not negatively affected by the rMCZ under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ 5, North of Celtic Deep</b>
Existing cables (telecom cables), recreation and shipping.	

## 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 <sup>31</sup> ✓ = 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 5, North of Celtic Deep
ENG Feature	Represent- ativity	Replicatio n	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
Subtidal sands and gravels	FOCI	✓	✓	✓	None	Recover			BAP habitat
A4.2 Moderate energy circalittoral rock	BSH	✓	✓	✓ * <sup>1</sup>	None	Maintain	This habitat has limited distribution within the regional project area	Only a small proportion of this BSH is currently protected within existing MPAs	
A5.1 Subtidal coarse sediment	BSH	✓	✓	✓	None	Recover	Out of all of the rMCZs and existing MPAs, this site contributes the second largest area of subtidal coarse sediment.	Only a very small proportion of this feature is protected in existing MPAs	Only a very small proportion of this feature is protected in existing MPAs within the Irish Sea Regional Sea.
A5.2 Subtidal sand	BSH	✓	✓	✓	None	Recover			

<sup>31</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Site considerations	
Connectivity	✓ * 2
Geological/Geomorphological features of interest	✓ * 3
Appropriate boundary	✓
Areas of additional ecological importance	✓ * 4
Overlaps with existing MPAs	None

**Additional comments and site benefits:**

- <sup>1</sup> There is only a small patch of moderate energy circalittoral rock.
- <sup>2</sup> This site is essential for the connectivity between the rock and soft sediment features in Finding Sanctuary sites and the Irish Sea sites.
- <sup>3</sup> Although this site does not have any primary geological or geomorphological features of interest proposed for designation, the rMCZ does have glacial erosional features. There is interesting bathymetry in the south of the site as it overlaps with the Celtic Deep, an area of increased depth in comparison to much of the continental shelf.
- <sup>4</sup> 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 a seasonal thermal front and areas of high and medium benthic species biodiversity and an area of medium benthic biotope biodiversity (Langmead, et al. 2010).

**Table 5. Anticipated benefits to ecosystem services**

The habitats, species and other ecological features of the 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 (welfare) derived from 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 H5.

Table 5a. Fish and shellfish for human consumption		rMCZ 5, North of Celtic Deep
Baseline	Beneficial impact under <i>Policy Option 1</i> and <i>Policy Option 2</i>	
Features to be protected by the rMCZ contribute to the delivery of fish and shellfish for human consumption (Fletcher and others (2012)).UK fishing activity in the site is very low. However, there is some evidence	If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. The abundance, size/age, biomass and recruitment of fish in the site are also expected to benefit. These benefits are	Anticipated direction of change:


Table 5a. Fish and shellfish for human consumption		rMCZ 5, North of Celtic Deep
<p>of UK fishing vessels using bottom trawls, nets, and hooks and lines in the site. Belgian, Spanish and French bottom trawlers are known to fish in the site. See Table 2 for more detail.</p> <p>Subtidal gravel and sand sediments are often important as nursery areas for fish such as plaice <i>Pleuronectes platessa</i> (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)). Offshore, sand and gravel habitats support internationally important fish and shellfish fisheries (UK Biodiversity Partnership (2010) in Fletcher and others (2012)).</p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in an unfavourable condition.</p>	<p>expected to accrue as a result of reduced fishing mortality and reduction of gear interaction with the sea bed (see Annex L).</p> <p>It is assumed that the site will be closed to bottom trawls, dredges and to nets and hooks and lines to varying degrees. Therefore, there will be no benefits to fisheries from vessels using these gear types in the site. However, spill-over effects could generate benefits for vessels fishing just outside the rMCZ (Blythe and others, 2002; Reid, 2011; Bennett and Hough, 2007; Sweeting and Polunin, 2005; Partnership for Interdisciplinary Studies of Coastal Oceans (2011)). It is not possible to estimate the value to fishing vessels of this potential spill-over effect.</p> <p>There may be benefits for mid-water trawlers and static gear vessels (if it is not being managed) which will be allowed to fish in the site but there is currently no evidence to support or refute this. Nor is there any evidence of mid-water trawling currently taking place in the site. It is not known whether pelagic species would benefit from the proposed fisheries restrictions.</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>	 Confidence: Moderate


Table 5b. Regulating services		rMCZ 5, North of Celtic Deep
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Recover:</b></p> <p><b>Regulation of pollution:</b> The features of the site contribute to the recycling of waste and capture of carbon. Through the processes that occur in their upper layers, marine sediments (including sand) have an important role in the global cycling of many elements, including carbon and nitrogen (Burdige (2006) in Fletcher and others (2012)). Similarly, nitrification occurring in marine sediments is an important component of the global nitrogen cycle and may play a role in regulating oceanic</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. Management of human activities in the site is expected to improve the condition and abundance of features in the site. Therefore, regulation of pollution services is anticipated to be of benefit.</p> <p>It is assumed that the site will be closed to bottom trawls, dredges and to nets and hooks and lines to varying degrees. Therefore, species richness could</p>	<p>Anticipated direction of change:</p>  Confidence:

Table 5b. Regulating services		rMCZ 5, North of Celtic Deep
<p>nitrogen (Burdige (2006) in Fletcher and others (2012)).</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems. The level of the service that is provided is related to the diversity and condition of species and habitats in the rMCZ, and the range of their sensitivity to different impacts.</p> <p>Subtidal sediment (including sand) found in sheltered or deeper water is one of the most diverse habitats with bivalves, polychaetes, amphipods, sessile and mobile epifauna (UK Biodiversity Partnership (2010) in Fletcher and others (2012)) and also a high abundance of starfish and brittlestar (Fletcher and others (2012)).</p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in an unfavourable condition.</p> <p><b>Maintain:</b></p> <p>At depth, polychaetes, sponges, cnidarians and bryozoans were found to form a diverse community within circalittoral rock (Cebrian (2000) in Fletcher and others (2012)). Species include starfish, sea urchins, algae and large ascidians (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)). The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in a favourable condition.</p>	<p>increase. In particular species such as seapens and brittle star may benefit as they have been found to be impacted on by bottom trawling (Greathead and others (2005); Adey and others (2006); Adey (2007); Kaiser and others (2000) in Blythe and others (2002)).</p> <p>Designating the rMCZ is also likely to protect the MCZ features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.</p> <p>If the conservation objectives of the features are achieved, the features will be maintained in a favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).</p>	<p>Moderate</p> <p>Anticipated direction of change:</p> <p>⇔</p> <p>Confidence: Moderate</p>

Table 5c. Research and Education		MCZ 5, North of Celtic Deep
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Table 5c. Research and Education		MCZ 5, North of Celtic Deep
The level of research undertaken in the site is unknown.	Monitoring of the rMCZ will help 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. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	<p>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: High</p>

Table 5d. Non-use and option values		rMCZ 5, North of Celtic Deep
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
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.	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 (MPAs). 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 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>Anticipated direction of change:</p> <p>↑</p> <p>Confidence: Moderate</p>

**Recommended Marine Conservation Zone (rMCZ) 8, Fylde Offshore****Site area (km<sup>2</sup>): 260.27**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

**Table 1. Site-specific benefits arising from the rMCZ (over 2013 to 2032 inclusive)**

<b>Table 1. Conservation impacts</b>				<b>rMCZ 8, Fylde Offshore</b>
<b>1a. Ecological description</b>				
<p>This site is located in Liverpool Bay, approximately 3.6km off the (Lancashire) Fylde coast. The depth of the sea bed ranges from almost being exposed on a low tide (just 0.35 metres in depth) to 22 metres. The site is located within the Liverpool Bay Special Protection Area (SPA), which is designated to protect the populations of overwintering red throated diver <i>Gavia stellata</i> and common scoter <i>Melanitta nigra</i> and their supporting habitats. The subtidal sand habitat in this site is of ecological importance due to the high abundance of bivalve species and the high amount of benthic productivity that has been recorded in the site (Kaiser and others (2006) in ISCZ, 2011). Bivalves play a key role in unlocking the energy of primary producers which, in the sea, are the phytoplankton (microscopic algae) and making it available to be used as food by other creatures. As such, primary producers are the very basis of the food chain that provides the fish consumed by humans. The bivalves within rMCZ 8 are suspension filter feeders which live within the sediment itself; they filter suspended particles from the water column (via a siphon which extends up into the water) and discharge nutrient-rich particulates onto the sea bed (Dame (1996) in ISCZ, 2011). Bivalves also perform an important role in regulating and maintaining water quality by filtering suspended sediments and excess, potentially harmful, nutrients (such as nitrates and phosphates).</p> <p>Animals living in and around sandbanks, such as those found within the site, are varied but include common hermit crabs <i>Echichthys vipera</i>, sea stars <i>Asterias rubens</i>, flying crabs <i>Liocarcinus holsatus</i> and other shrimp-like crustaceans <i>Mysidacea</i> (Kaiser and others (2004) in ISCZ, 2011). Around this general area, the distribution and abundance of bivalves is closely linked to the distribution of the common scoter <i>Melanitta nigra</i> (Kaiser and others (2006) in ISCZ, 2011). The Centre for Environment, Fisheries and Aquaculture Science (Cefas) has identified that this area is very important as nursery and spawning grounds for several commercially important fish species, including sole, plaice and whiting (Ellis, 2012). Areas where common scoters were recorded in greater numbers generally corresponds with the areas with the highest abundance and biomass of bivalve prey species; this underlines the importance of what is otherwise a very common habitat type in the Irish Sea. The overlapping of the site within Liverpool Bay SPA will provide additional protection to the sea bed features within the rMCZ area. The SPA provides the appropriate protection to overwintering red throated divers and common scoters and their prey and habitats but this may provide only spatial and temporal protection to other sea bed species and habitats which this rMCZ seeks to protect. The large numbers of sand eels <i>Ammodytes</i> spp. present in sandy sediment attract sea birds such as puffins, razorbills, guillemots and terns. This habitat type is an important area for crabs and other epifauna, in particular echinoderms. Hermit crabs <i>Pagurus bernhardus</i>, the swimming crab <i>Liocarcinus depurator</i> and the edible crab <i>Cancer pagurus</i> feed on prey in this habitat (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)). Source: ISCZ (2011).</p>				
<b>1b. MCZ Feature Baseline and Impact of MCZ</b>				
<b>Feature</b>	<b>Area of feature (km<sup>2</sup>)</b>	<b>No. of point records</b>	<b>Baseline</b>	<b>Impact of MCZ</b>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<i>Broad-scale Habitats</i>				
Subtidal Sand	260.04	-	Favourable condition	Maintain at favourable condition
<i>Habitats of Conservation Importance</i>				
Subtidal Sand and Gravels	199.53	10	Favourable condition	Maintain at favourable condition

**Table 2. Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)**

Table 2a. Archaeological heritage		rMCZ 8, Fylde Offshore
<b>Source of costs of the rMCZ</b> 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 <i>under Policy Option 1 and Policy Option 2</i>	
Evidence of archaeology is recorded in this site, including the wreck of a Norwegian cargo vessel and possibly a steam trawler. There is also evidence of World War II military aircraft wrecks 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 of one licence application could be in the region of £500 to £10,000 depending on the size of the MCZ (English Heritage, pers. comm., 2012). The impact on the UK economy is not likely to be significant. No further impacts on activities related to archaeology are anticipated.	

Table 2b. Ports, harbours, shipping and disposal sites		rMCZ 8, Fylde Offshore
<b>Source of costs of the rMCZ</b> <b>Management scenario 1:</b> Not applicable to this site. <b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to future navigational dredging, disposal of dredge material and port developments. It is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed for port developments or port-related activities due to this rMCZ relative to the baseline.		
Baseline description of activity	Costs of impact of rMCZ on the sector <i>under Policy Option 1 and Policy Option 2</i>	



<p><b>Disposal sites:</b> There is one disposal site within 5km of the rMCZ linked to the port of Preston. No licence applications were received for this disposal site between 2001 and 2010 but it is not closed to disposal in the future (Cefas, pers. comm. 2011)).</p>							
<p><b>Port Development:</b> There is one port within 5km of this rMCZ: Lytham St. Annes. No port developments are known to be planned within the 20 year period of the Impact Assessment (IA).</p>	<table><tr><th>£m/yr</th><th>Scenario 1</th><th>Scenario 2</th></tr><tr><td>Cost to the operator</td><td>0.000</td><td>&lt;0.001*</td></tr></table> <p>* 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. See Annex H12 for further information.</p> <p><b>Scenario 1:</b> Not applicable.</p> <p><b>Scenario 2:</b> Although the disposal site rMCZ has not been used in the last ten years, it might be used during the 20 year period covered by the IA. Future licence applications for disposal of material in the disposal site and port or harbour development plans or proposals within 5km of the rMCZ will need to consider the potential effects of the activity on the features protected by the rMCZ. Sufficient information is not available to identify whether any additional mitigation of impacts on features protected by the MCZ will be needed for proposed future port and harbour developments relative to the mitigation provided in the baseline. Unknown potentially significant costs of mitigation could arise.</p>	£m/yr	Scenario 1	Scenario 2	Cost to the operator	0.000	<0.001*
£m/yr	Scenario 1	Scenario 2					
Cost to the operator	0.000	<0.001*					

Table 2c. Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ 8, Fylde Offshore
<p><b>Oil and gas related activities (including carbon capture and storage)</b></p> <p>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 H11 and Annex N10 (they are not assessed for this site alone).</p>	

**Table 3. 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 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 8, Fylde Offshore
Existing cables (interconnectors and telecom cables), commercial fisheries and 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 scale<sup>32</sup></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 8, Fylde Offshore
ENG Feature	Represent- ativity	Replicati on	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
A5.3 Subtidal sand	BSH	✓	✓	✓	None	Maintain	This site contributes the second largest area of subtidal sand to the region.		
Subtidal sands and gravels	FOCI Habitat	✓	✓	✓	None	Maintain			
<b>Site considerations</b>									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				✓ * 1					
Overlaps with existing MPAs				✓					

**Additional comments and site benefits:**

<sup>32</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

- <sup>1</sup> CEFAS sensitivity surveys have identified this area as being very important as nursery and spawning areas for several commercially important fish species (Ellis, et al. 2012).
- The rMCZ has scientific value with research having been undertaken to assess the types, size and biomass of bivalves [as] the key prey for common scoter Kaiser, et al. 2006).

### Table 5. Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the 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 (welfare) derived from 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 H5.

Table 5a. Fish and shellfish for human consumption		rMCZ 8, Fylde Offshore
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p>Features to be protected by the rMCZ contribute to the delivery of fish and shellfish for human consumption (Fletcher and others (2012)).</p> <p>Relatively little fishing takes place in the site. Approximately 10 vessels (mostly from ports in north-west England) use bottom trawls to target sole, plaice, prawns, shrimps, skates and rays and flounders. Fewer than five vessels are known to use static gear (pots and traps; gill, drift and push nets) to target whelks, lobsters, crabs, brill, thornback rays, turbot, monkfish, mullets, bass, Atlantic salmon and shrimps. Fewer than five vessels dredge the area for scallops although this is questioned by NWIFCA who know of no scallop dredging in the area (pers. comm., 2012). The area was once important fishing grounds for the port of Fleetwood; however, very few vessels associated with this port are still active. See Table 2 for more detail.</p> <p>Subtidal gravel and sand sediments are often important as nursery areas for fish such as plaice <i>Pleuronectes platessa</i> (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)). Offshore, sand and gravel</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in a favourable condition.</p> <p>No additional management (above that in the baseline situation) of fishing activities is expected. As such, no benefits are expected to accrue as a result of reduced fishing mortality. No change in on-site feature condition or fishing mortality is anticipated and therefore no impact on on-site or off-site benefits 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 style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Table 5a. Fish and shellfish for human consumption		rMCZ 8, Fylde Offshore
<p>habitats support internationally important fish and shellfish fisheries (UK Biodiversity Partnership (2010) in Fletcher and others (2012)).</p> <p>Cefas sensitivity surveys have identified this area as being very important as nursery and spawning grounds for several commercially important fish species, including sole, plaice, and whiting (Ellis and others (2012)).</p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in a favourable condition.</p>		

Table 5b. Regulating services		rMCZ 8, Fylde Offshore
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>	
<p><b>Maintain:</b></p> <p><b>Regulation of pollution:</b> The features of the site contribute to the recycling of waste and capture of carbon. Through the processes that occur in their upper layers, marine sediments (including sand) have an important role in the global cycling of many elements, including carbon and nitrogen (Burdige (2006) in Fletcher and others (2012)). Similarly, nitrification occurring in marine sediments is an important component of the global nitrogen cycle and may play a role in regulating oceanic nitrogen (Burdige (2006) in Fletcher and others (2012)).</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems. The level of the service that is provided is related to the diversity and condition of species and habitats in the rMCZ, and the range of their sensitivity to different impacts.</p> <p>Subtidal sediment (including sand) found in sheltered or deeper water is one of the most diverse habitats with bivalves, polychaetes, amphipods,</p>	<p>If the conservation objectives of the features are achieved, the features will be maintained in a favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↔</p> <p>Confidence: Moderate</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<b>Table 5b. Regulating services</b>		<b>rMCZ 8, Fylde Offshore</b>	
sessile and mobile epifauna (UK Biodiversity Partnership (2010) in Fletcher and others (2012)) and also a high abundance of starfish and brittlestar (Fletcher and others (2012)).			
The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in an unfavourable condition.			


Table 5c. Research and education		rMCZ 8, Fylde Offshore	
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>		
The extent of research undertaken in the site is not known. Cefas has conducted research in and around the site into fish spawning and nursery areas (Ellis and others (2012)).	Monitoring of the rMCZ will help 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. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	Anticipated direction of change: 	Confidence: High


Table 5d. Non-use and option values		rMCZ 8, Fylde Offshore	
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>		
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.	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 (MPAs). 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 the features and the ecosystem services provided, and thereby	Anticipated direction of change: 	Confidence: Moderate

Table 5d. Non-use and option values		rMCZ 8, Fylde Offshore
	<p>the option to benefit from these services in the future, from the risk of future degradation.</p> <p>A survey of beach users in coastal areas of the north-west of England was undertaken in 2011 by liaison officers in the Irish Sea Conservation Zones Project Area. Of nine members of the public who commented on the potential designation of rMCZ 8, seven said it was a 'good' or 'very good' idea. Reasons stated included the need to conserve and protect marine biodiversity. Two respondents said it is a good thing as long as they do not affect the operation of wind farms.</p>	

### Recommended Marine Conservation Zone (rMCZ) 11, Cumbrian Coast

Site area (km<sup>2</sup>): 17.17

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.
- Based on SNCB advice, draft conservation objectives for some features have been changed from those established by the Regional Sea Projects. These changes and their impacts on management and costs are reflected under Policy Option 2

**Table 1. Site-specific benefits arising from the rMCZ (over 2013 to 2032 inclusive)**

Table 1. Conservation impacts	rMCZ 11, Cumbrian Coast
<b>1a. Ecological description</b>	
<p>Recommended MCZ 11 is located on the Cumbrian coast in the eastern Irish Sea, extending from St Bees Head in the north to the Ravenglass Estuary in the south. The site is almost wholly intertidal, and is recommended to protect features such as biogenic reefs, blue mussel <i>Mytilus edulis</i> beds and honeycomb worm <i>Sabellaria alveolata</i> reefs (Lancaster (2010) in ISCZ, 2011). There are also peat and clay exposures (Seeley and others (2010) in ISCZ, 2011) and intertidal underboulder communities (Lancaster (2010) in ISCZ, 2011) present in the site.</p> <p>The northern portion of the site extends further seawards than the low water mark to incorporate an important black guillemot feeding and loafing area. This will complement the Royal Society for the Preservation of Birds (RSPB) reserve/Site of Special Scientific Interest (SSSI) protection on the cliffs of St Bees Head. St Bees Head is the only known location for breeding black guillemot in England. Recommended MCZ 11 is an important area for sea birds in the Irish Sea, providing a foraging and loafing ground for a wide range of species including guillemots <i>Uria aalge</i>, razorbills <i>Alca torda</i> and puffins <i>Fratercula arctica</i> which originate from English and Scottish colonies (RSPB, pers comm., 2011).</p> <p>This site includes some of the most extensive and best represented examples of honeycomb worm <i>Sabellaria alveolata</i> reefs in the UK. Individually, these tube-dwelling</p>	

## Annex I2. Site specific *Impact Assessment materials (Option 2)*

worms cement together sand grains to form the structure in which they live. Collectively, these structures are important to sediment dynamics and they also support a range of other species.

In addition, the blue mussel beds fulfil a similar biogenic reef function by providing shelter for other species, such as the periwinkles, dog whelks and algae recorded in rMCZ 11 (Lancaster (2010) in ISCZ, 2011). The intertidal underboulder communities in this area are also notably diverse. Beadlet anemones *Actinia equina*, purse sponges *Sycon ciliatum*, hornwrack *Flustra foliacea*, starfish *Asterias rubens*, long and broad clawed crabs *Pisidia longicornis* and *Porcellana platycheles*, keel worms *Pomatoceros lamarcki*, shore crabs and dahlia anemone *Urticina feline* were all recorded (Lancaster (2010) in ISCZ, 2011).

Peat and clay exposures are visible along parts of the southern portion of rMCZ 11 (Hazell (2008, used in Seeley and others, 2010) in ISCZ, 2011). A UK Biodiversity Action Plan (UK BAP) priority habitat, the key species associated with peat and clay exposures are piddocks, a type of burrowing bivalve, *Pholas dactylus*, *Barnea candida* and *Barnea parva*. The fact that these exposures are an irreplaceable habitat type (they are composed of former lake bed sediments and ancient forested peatland (termed 'submerged forests') underlies their ecological significance, but also their archaeological interest.

Recommended MCZ 11 also encompasses the full extent of Barn Scar and Kokoaprah Rocks. These two cobble and boulder scars are particularly diverse in marine life. Species such as: barnacles, common limpets, beadlet anemones, tube worms, encrusting sponges, bryozoans, sea squirts, periwinkles, topshells, whelks, sea urchins, some starfish, common shore crabs, shrimps and blennies can all be found. The lower shore exhibits seaweeds such as sugar kelp and oarweed and toothed wrack *Fucus seratus*, spiral wrack *Fucus spiralis* and bladder wrack *Fucus vesiculosus*. Under the canopy of seaweeds, rocks are covered with bryozoans and hydroids, barnacles and Ross worm *Sabellaria spinulosa* crusts (Lancaster (2010) & Lumb, pers. comm., 2011, in ISCZ, 2011). Mid-shore, Barn Scar to Drigg coast has some persistent scar areas with small honeycomb worm *Sabellaria alveolata* mounds and mussels *Mytilus edulis* (Lancaster (2010) in ISCZ, 2011).

The rocky shore habitat present around St Bees Head is one of the most exposed shores on the Cumbrian coast (Lancaster (2010) in ISCZ, 2011) and is a rare habitat type throughout the ISCZ project region. A range of algal species has been recorded there. Dulce (a red algae) and Irish moss can be found on the lower shore; in the mid-shore zone red seaweeds, bladder wrack and fucus are present, while spiral and egg wrack are common on the upper shore (Lancaster (2010) in ISCZ, 2011). The red sandstone that makes up the rocky shore is an important area for algae, such as narrow leafed eelgrass *Zostera angustifolia* (Brodie and others (2007) in ISCZ, 2011). Source: ISCZ (2011).

### 1b. MCZ Feature Baseline and Impact of MCZ

Feature	Area of feature (km <sup>2</sup> )	No. of point records	Baseline	Impact of MCZ
<i>Broad-scale Habitats</i>				
High Energy Intertidal Rock	0.04	-	Favourable condition	Maintain at favourable condition
Intertidal Sand and Muddy Sand	5.01	-	Unfavourable condition	Recover to favourable condition
Intertidal Biogenic Reefs	0.85	-	Favourable condition	Maintain at favourable condition
High Energy Infralittoral Rock	0.40	-	Unfavourable condition	Recover to favourable condition
<i>Habitats of Conservation Importance</i>				
Blue Mussel Beds	-	2	Favourable condition	Maintain at favourable condition

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Intertidal Underboulder Communities	-	8	Favourable condition	Maintain at favourable condition
Peat and Clay Exposures	-	2	Favourable condition	Maintain at favourable condition
Honeycomb Worm Reefs	0.61	11	Unfavourable condition	Recover to favourable condition
<i>Non-ENG Features</i>				
Black Guillemots	-	< 50 pairs	Favourable condition	Maintain at favourable condition
<b>SNCB advice recommends that the conservation objective for Black Guillemots is changed from “Maintain” to “Recover”. Therefore Option 2 uses the conservation objective “Recover to favourable condition” for this feature.</b>				
<p><b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage,, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below.</p> <p>Honeycomb Worm Reefs.</p>				

**Table 2. Site-specific costs arising from the effect of the rMCZ on human activities (over 2013 to 2032 inclusive)**

Table 2a. Archaeological heritage		rMCZ 11, Cumbrian Coast
<p><b>Source of costs of the rMCZ</b></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. However, restrictions could also be placed upon anchoring in areas of vulnerable MCZ features in the site, including Honeycomb Worm Reef, and upon archaeological excavation in areas of peat and clay exposures in the site.</p>		
Baseline description of activity	Costs of impact of rMCZ on the sector <i>under Policy Option 1 and Policy Option 2</i>	
The wreck of a Spanish steamer vessel is recorded in the site. A further 64 vessel wrecks are attributed to this area as well as one British World War II aircraft. However, it is not clear if the wrecks are located in the site or nearby. Peat is recorded at St Bees and at Drigg. Mesolithic flint sites and hearths have also been recorded in the site. A historic fish trap is also located in the site (English Heritage, pers. comm., 2012). 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).	<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 of one licence application could be in the region of £500 to £10,000 depending on the size of the MCZ (English Heritage, pers. comm., 2012). The impact on the UK economy is not likely to be significant. No further impacts on activities related to archaeology are anticipated.</p> <p>If archaeologists respond to restrictions on excavation in areas of peat and clay exposures, and restrictions on anchoring over areas of Honeycomb Worm Reef, by undertaking an alternative archaeological excavations in another locality, this could result</p>	



Annex I2. Site specific *Impact Assessment materials (Option 2)*

	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 (IA). If archaeological excavations do not take place as a result of these restrictions, this will prevent interpretation of archaeological evidence from the site which will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.
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Table 2b. Coastal development		rMCZ 11, Cumbrian Coast
<b>Source of costs of the rMCZ</b>		
<b>Management scenario 1:</b> 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).		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2	
<p>The need for a new marine landing facility at the new nuclear power station at Sellafield (planned for delivery before 2025) was identified in the 2011 National Nuclear Policy Statement. Submission of a licence application is not anticipated for at least 5 years (Natural England, pers. comm., 2012). As such, no further information is available at this time. However, the impact of any development on the features of conservation importance (not broad-scale habitats) protected by the rMCZ, would have to be assessed already in the absence of the rMCZ.</p> <p>A temporary landing facility was recently given planning permission at Sellafield and this did not have significant environmental impacts upon features of conservation importance in the rMCZ (this occurred regardless of the rMCZ) (Natural England, pers. comm., 2012).</p> <p>The operator of Sellafield nuclear power station carries out environmental monitoring of the coastline at various sampling points in this rMCZ. Monitoring is undertaken to assess the impacts that discharges from Sellafield nuclear power station have on people and the</p>	<p>The MCZ is unlikely to prohibit the installation of a marine landing facility in the site (although this does not pre-judge a licensing decision) (Natural England, pers. comm., 2012). Planning permission was given recently to a temporary landing facility at the same location which considered its impact upon features of conservation importance. Impact upon the rMCZ features in the vicinity of the proposed facility is therefore considered in the absence of the MCZ designation. It is likely that an additional cost will be incurred in the assessment of environmental impact in support of the licence application, and that some re-routing of vehicle access during construction or operation may be required to avoid the sensitive features. Based on the information available, it is not possible to identify what other additional mitigation due to the rMCZ may be required, and therefore it is not possible to quantify the likely cost. However, based on the experience with the temporary landing facility, Natural England feels that this is unlikely to affect construction significantly and incur a significant cost (Natural England, pers. comm., 2011).</p> <p>Natural England (pers. comm., 2012) has advised that it is unlikely that the monitoring programme would be considered to have an impact on the features of the site. This is because the sample/monitoring area is very small in relation to the area of broad-scale habitat. With regards to features of conservation importance in the rMCZ, due regard to the potential impact of the monitoring programme upon these feature would need to be considered in the absence of the MCZ designation. Therefore, it is not anticipated that additional costs would be incurred to the operator of Sellafield due to the presence of the MCZ.</p>	

Table 2b. Coastal development		rMCZ 11, Cumbrian Coast
<b>Source of costs of the rMCZ</b>		
<b>Management scenario 1:</b> 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).		
Baseline description of activity	Costs of impact of rMCZ on the sector <i>under Policy Option 1 and Policy Option 2</i>	
environment. This takes place along the coastline and in the sea. It is possible that monitoring frequency and scale could increase during the course of the IA period of analysis (Environment Agency, pers. comm., 2012).		

Table 2c. Commercial fisheries	rMCZ 11, Cumbrian Coast
<b>Source of costs of the rMCZ</b>	
The Joint Nature Conservation Committee (JNCC) and Natural England have advised that there is considerable uncertainty about whether additional management of bottom trawling and the use of hooks and lines will be required for certain features potentially protected by the rMCZ. Therefore, two scenarios have been employed in the IA for these fisheries to reflect this uncertainty: no additional management, and closure of the fishery within the site. Should the site be designated, the management required will fall somewhere within this range.	
<b>Management scenario 1:</b> Entire rMCZ is open to all gear types.	
<b>Management scenario 2:*</b>	
<ul style="list-style-type: none"> <li>• Closure of areas of High Energy Infralittoral Rock to pots and traps only.</li> <li>• Closure of areas of biogenic reefs, Honeycomb Worm Reefs, peat and clay exposures and mussel beds to hand collection of shellfish.</li> <li>• Gill netting and vessel speed managed out to 1km offshore from St Bees' Head only. The required management has not yet been identified and is subject to further stakeholder discussion. For the purpose of the IA, it is assumed that no management of gill netting and vessel speed will be required.</li> </ul>	
<b>Management scenario 3:**</b> Closure of entire rMCZ to bottom trawls, dredges, hooks and lines, nets (including gill netting), pots and traps, and collection by hand.	
* This is the management scenario identified by the vulnerability assessment using information collected from stakeholders.	
** Natural England and the JNCC advise that hooks and lines, nets, and pots and traps need to be managed in the vicinity of High Energy Infralittoral Rock only; and that collection by hand needs to be managed only in the vicinity of Intertidal Sand and Muddy Sand only. However, for ease of analysis, the loss of landings estimate represents the loss of landings from the entire rMCZ and as such will be an overestimate.	
<b>Summary of all UK commercial fisheries:</b> The site lies completely within the 6 nautical mile (nm) limit. A number of commercial fishing restrictions are already in existence (listed in Annex E). Of approximately 700 UK vessels that are known to be active in the Irish Sea Conservation Zones (ISCZ) Project Area (MMO, 2007–10), at least 15 UK vessels are known to fish in this site (both under and over 15 metre vessels). They use bottom trawls, pots and traps, mid-water trawls, nets, dredges, and hooks and lines. These vessels are all from Cumbrian and Lancashire ports (ISCZ, 2010). However, as the site is immediately adjacent to the shore (and 500 metres wide in most places), it is	

Table 2c. Commercial fisheries		rMCZ 11, Cumbrian Coast		
thought that not all of these vessels would actually be fishing this close to shore. Vessel Monitoring System (VMS) data for over 15 metre vessels do not provide any evidence of fishing activity this close to shore (MMO, 2011a). Fewer than 5 fishers are known to regularly use hand gear and hand-pick in and around the site for mussel, cockle, razor clam and shrimp (ISCZ, 2010); however, the level of effort depends on the occurrence of mussel and cockle beds and when they are opened to harvesting. When mussel and cockle beds are opened, the numbers of fishers hand-picking in the site will greatly increase. The estimated total value of landings (including hand collection of shellfish) from the site is £0.094m/yr, but in years when shellfish spats occur and the beds are opened for commercial gathering the value can increase to £5m to £10m/yr (based on an internet search for media reports covering the last ten years). This is provided for each affected gear type below.				
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries <i>under Policy Option 1 and Policy Option 2</i>		
<b>Bottom trawls:</b> At least nine vessels are known to use bottom trawls in the site (ISCZ, 2010). These vessels are associated with the ports of Whitehaven, Workington, Maryport, Fleetwood and Barrow. They target a mix of species throughout the year: brill, cod, common prawn, dover sole, plaice, pollack, rockfish, skates and ray, solenette, turbot and whitefish (ISCZ, 2010). The estimated value of landings from the site is £0.070m/yr.	The annual value of UK landings affected is estimated to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	Scenario 3
	Value of landings affected	0.000	0.000	0.070
		Stakeholders have not provided a description of impact. In establishing the draft conservation objectives, sensitive features in the rMCZ may have been 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.		
<b>Dredges:</b> Fewer than 5 vessels are known to use dredges in the site (ISCZ, 2010). They are all from English ports, targeting mussel seed when spats arise and permission is granted (ISCZ, 2010). The estimated value of landings from the site is £0.002m/yr. This value is likely to be highly variable, and much higher in years when mussel spat occurs within the rMCZ.	The annual value of UK landings affected is estimated to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	Scenario 3
	Value of landings affected	0.000	0.000	0.002
		Stakeholders have not provided a description of impact. In establishing the draft conservation objectives, sensitive features in the rMCZ may have been assessed as having low vulnerability to fishing with dredges 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.		
<b>Pots and traps:</b> Fewer than 5 UK vessels are known to use pots and traps in the vicinity of High Energy Infralittoral Rock in the site for lobster and crab. At least nine vessels using pots and traps are known to be active in the entire site (ISCZ, 2010). They are active all year but mostly in the summer months. VMS data does not indicate any fishing activity by	The annual value of UK landings affected is estimated to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	Scenario 3
	Value of landings affected	0.000	0.001	0.010
		Stakeholders have not provided a description of impact. Though the impact on the UK economy		

Table 2c. Commercial fisheries		rMCZ 11, Cumbrian Coast		
over 15 metre UK vessels in the site (MMO, 2011a). The estimated value of landings from the site is £0.010m/yr (MCZ Fisheries Value Model).	is not likely to be significant, the impacts on individual fishers could be significant.			
<b>Collection by hand (mussel only):</b> About three fishers commercially gather winkle ('covins') at Barn Scar, which accommodates blue mussel beds and Honeycomb Worm Reefs. However, there has been very little activity there in recent years. The level of winkle gathering is dependent on demand from the European market. There are sudden increases in activity when the prices are good. This has been known to attract gangs and migrant workers. The winkles are bought and sold through local agents. There is also non-commercial crab hooking at Barn Scar (Whitehaven Fishermen's Association & NWIFCA, 2011). Fewer than five fishers are known to collect mussel by hand in the site. It is assumed that this takes place in the parts of the site which are vulnerable to this activity (as listed above) (ISCZ, 2010). It should be noted that commercial gathering of mussels is managed by the North Western Inshore Fisheries and Conservation Authority (NWIFCA) along the Cumbrian coast. NWIFCA knows of no commercial mussel picking in this particular site. However, winkle gathering and crab hooking is likely to take place in the site and could take place in the vicinity of sensitive MCZ features (Whitehaven Fishermen's Association & NWIFCA, 2011). The estimated value of landings from the site is 0.012m/yr (MCZ Fisheries Value Model). The FisherMap data are the best available data for intertidal fisheries. However, confidence in the data is low as, on the one hand, they are overestimates because the fishing grounds mapped by fishers represent areas greater in size than the rMCZ itself and will include values for nearby valuable cockle and mussel fishery areas such as the Ribble Estuary and Morecambe Bay. On the other hand, not every intertidal fisher has been interviewed, although we estimate about 30% of regular north-west of England intertidal fishers provided data. It should be noted that the estimated values are only indicative due to the inherent un-predictability of where and when cockle and mussel spats will	The annual value of UK landings affected is estimated to fall within the following range:			
	£m/yr	Scenario 1	Scenario 2	Scenario 3
	Value of landings affected	0.000	0.001	0.001
In establishing the draft conservation objectives, sensitive features in the rMCZ may have been assessed as having low vulnerability to collection by hand 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.				
<b>Comments from the Cumbrian fishing fleet and NWIFCA:</b> Regarding Scenarios 2 and 3: Collection by hand will be managed in areas of Intertidal Sand and Muddy Sand only. It is not clear if this activity takes place on Intertidal Sand and Muddy Sand; therefore, the estimate of impact may be over-stated. Though the impact on the UK economy is not likely to be significant, the impacts on individual fishers could be significant. Further detail on impacts to the fisheries sector can be found in Annex J and Annex F.				

Table 2c. Commercial fisheries		rMCZ 11, Cumbrian Coast											
occur, and whether they will be opened for harvesting. Also, because the numbers of people attracted who harvest from cockle and mussel beds when they are opened are unpredictable and difficult to manage, the real economic value of these beds is very hard to estimate. In the north-west of England waters, trends indicate that usually one large bed is opened once every 4 or 5 years, each generating in the region of £5m to £10m/yr worth of shellfish (based on an internet search for media reports covering the last ten years).													
<b>Hooks and lines:</b> Fewer than 5 vessels are known to use hooks and lines in the site (ISCZ, 2010). They are associated with the port of Maryport. They target bass, cod and plaice (ISCZ, 2010). The estimated value of landings from the site is <£0.001m/yr.		The annual value of UK landings affected is estimated 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>&lt;0.001</td></tr></table> Though the impact on the UK economy is not likely to be significant, the impacts on individual fishers could be significant. Stakeholders have not provided a description of impact. In establishing the draft conservation objectives, sensitive features in the rMCZ may have been 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.				£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										
<b>Nets:</b> Fewer than 5 vessels are known to use nets in the site (ISCZ, 2010). They are all English vessels associated with the ports of Maryport and Whitehaven. They target bass, brill, cod, mullet, plaice, salmon, sole and turbot throughout the year (ISCZ, 2010). The estimated value of landings from the site is <£0.001m/yr.		The annual value of UK landings affected is estimated 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>&lt;0.001</td></tr></table> Though the impact on the UK economy is not likely to be significant, the impacts on individual fishers could be significant. Stakeholders have not provided a description of impact. In establishing the draft conservation objectives, sensitive features in the rMCZ may have been 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.				£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										
Total direct impact on UK commercial fisheries under Policy Option 1 and Policy Option 2													

Table 2c. Commercial fisheries		rMCZ 11, Cumbrian Coast				
		The annual value of UK landings and gross value added (GVA) affected is estimated to fall within the following range:				
		£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate
		Value of landings affected	0.000	0.002	0.083	0.006
		GVA affected	0.000	0.001	0.034	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 overestimate for this site.				
		At least 16 vessels (using bottom trawls, pots and traps, nets, hooks and lines and dredges) could be affected and at least 5 intertidal fishers.				
		Some vessels fishing in the site use more than one gear type. Where there is evidence of this (from Fishermap or MMO (2011b)), duplication has been removed so that the number below represents the minimum number of vessels fishing in the site impacted under each scenario: Scenario 1: 0 Scenario 2: 4 Scenario 3: 16				
Baseline description of non-UK fisheries		Costs of impact of rMCZ on non-UK commercial fisheries <i>under Policy Option 1 and Policy Option 2</i>				
There is no evidence of non-UK vessels working in this site (MMO, 2011a).		None.				

Table 2d. Commercial fishing	rMCZ 11 Cumbrian Coast
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**Source of costs for the rMCZ****Policy Option 1**

No management anticipated, based on the Regional Project draft Conservation Objectives (and therefore no costs are anticipated).

**Policy Option 2**

SNCBs advice recommend that the conservation objective for the Black Guillemot (*Cepphus grylle*) be changed from “Maintain” to “Recover to Favourable Condition” due to the impacts of vessel speeds and possible gill netting, however, closure of the entire rMCZ to all fishing is already covered under management scenario 3. This means that costs in Option 2 are the same as the ones presented in Table 2c.

**Table 2e. Flood and coastal erosion risk management (coastal defence)****rMCZ 11, Cumbrian Coast****Source of costs of the rMCZ**

**Management scenario 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 and Policy Option 2**

Shoreline Management Plan (SMP) policy units that overlap with this rMCZ, but that are not anticipated to be impacted upon by it, are: 4.1, 5.2, 5.4, 5.5, 5.6, 7.1 and 1.1. This is because they are one of the following: no active intervention; managed re-alignment to natural shoreline; or hold the line (by maintaining defences, but seek to withdraw maintenance as soon as practicable).

It is assumed for the purposes of the IA that there is no risk of erosion to the railway line within the 20-year IA period of analysis under policy units 5.2, 5.4, 5.5 and 5.6 (Natural England, pers. comm., 2012).

SMP policy units (0–20 yrs) that could be impacted are as follows:

- 5.1: Hold the line (by maintaining the rock gabions at shore car park and maintaining/reconstructing the seawall fronting the B5344).
- 5.3: Hold the line (maintain linear revetment and rock armour defences).
- 5.7: Hold the line (with limited intervention, monitor erosion risk to

It is anticipated that no additional mitigation of impacts will be required (Natural England & 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 0.5–1 day of additional work, in most cases, 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.

Table 2e. Flood and coastal erosion risk management (coastal defence)		rMCZ 11, Cumbrian Coast
<b>Source of costs of the rMCZ</b> <b>Management scenario 1:</b> 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 and Policy Option 2	
railway, then maintain/upgrade railway defences as necessary). • 6.1: Hold the line (maintain defences to maintain the beach amenity, do not extend defences into SSSI to the south. Conduct further studies into long-term solutions for future flood and coastal erosion risk management of the beach amenity). (Natural England & Environment Agency, pers. comm., 2012)		

Table 2f. National defence		rMCZ 11, Cumbrian Coast
<b>Source of costs of the rMCZ</b> <b>Management scenario 1:</b> Mitigation of impacts of Ministry of Defence 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. The Ministry of Defence 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 and Policy Option 2	
The Ministry of Defence is known to make use of part of the site for a military firing range.	It is not known whether this rMCZ will impact on the Ministry of Defence's use of the site. However, the impact on the UK economy is not likely to be significant. Impacts of rMCZs on the Ministry of Defence's activities are assessed in Annex J.	

Table 2g. Ports, harbours, shipping and disposal sites	rMCZ 11 Cumbrian Coast
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<b>Source of costs of the rMCZ</b> <b>Management scenario 1:</b> Not applicable to this site. <b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to future navigational dredging, disposal of dredge material and port developments. It is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed for port developments or port-related activities due to this rMCZ relative to the baseline.				
Baseline description of activity		Costs of impact of rMCZ on the sector <i>under Policy Option 1 and Policy Option 2</i>		
<b>Disposal sites:</b> There are two disposal sites (Saltom Bay and Whitehaven) within 5km of the rMCZ. These are associated with the port of Whitehaven. The sum of the average number of licence applications received for these disposal sites is 0.1 per year (based on the number of licence applications received for these disposal sites between 2001 and 2010 (Cefas, pers. comm., 2011)).  <b>Port development:</b> The ports of Whitehaven, Sellafield and Ravenglass are located within 5km of this rMCZ. No port developments are known to be planned within the 20-year period of the IA.		£m/yr	Scenario 1	Scenario 2
		Cost to the operator	0.000	0.001
				Best estimate
				<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. See Annex H12 for further information. <b>Scenario 1:</b> Not applicable. <b>Scenario 2:</b> Future licence applications for disposal of material in the disposal sites and port or harbour development plans or proposals within 5km of the rMCZ will need to consider the potential effects of the activity on the features protected by the rMCZ. Sufficient information is not available to identify whether any additional mitigation of impacts on features protected by the MCZ will be needed for proposed future port and harbour developments relative to the mitigation provided in the baseline. Unknown potentially significant costs of mitigation could arise.		

Table 2h. Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ 11, Cumbrian Coast
<b>Cables (interconnectors and telecom cables)</b> 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 H6 and Annex N3 (they are not assessed for this site alone).	

Table 3. Human activities in the site that are not negatively affected by the rMCZ (over 2013 to 2032 inclusive)

<b>Table 3. Human activities in the site that are not negatively affected by the rMCZ under Policy Option 1 and Policy Option 2 (existing activities at their current levels and future proposals known to the regional MCZ projects)</b>	<b>rMCZ 11, Cumbrian Coast</b>
Existing cables (telecom cables), recreation, shipping and water pollution from activities on land. The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>33</sup> ✓ = 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 11, Cumbrian Coast
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
A1.1 High energy intertidal rock	BSH	✓	✓	✓ * 1	None	Maintain	There are only two replicates for high energy intertidal rock within the project area.	Not protected in existing MPAs	
A2.2 Intertidal sand and muddy	BSH	✓	✓	✓ * 1	None	Maintain			

<sup>33</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

sand									
A2.7 Intertidal biogenic reefs	BSH	✓	✓	✓ * 1	None	Recover		The Cumbrian coast has some of the most extensive and best represented examples of honeycomb worm reefs in the UK	The Cumbrian coast has some of the most extensive and best represented examples of honeycomb worm reefs in the UK
A3.1 High energy infralittoral rock	BSH	✓	X	✓	None	Recover	Replication is at its minimum for this feature.		
Blue mussel beds ( <i>Mytilus edulis</i> )	FOCI Habitat	✓	✓	✓ * 2	None	Maintain			
Peat and clay exposures	FOCI Habitat	✓	✓ * 3	✓	None	Maintain			
Intertidal underboulder communities	FOCI Habitat	✓	✓	✓	None	Maintain		This is one of the best examples of underboulder shores in this region	
Honeycomb worm <i>Sabellaria alveolata</i> reefs	FOCI Habitat	✓	✓	✓	None	Recover		The Cumbrian coast has some of the most extensive and best	The Cumbrian coast has some of the most extensive and best represented examples of

Annex I2. Site specific *Impact Assessment materials (Option 2)*

								represented examples of honeycomb worm reefs in the UK	honeycomb worm reefs in the UK
Black guillemot <i>Cephus grylle</i>	Non-ENG	N/A	N/A	N/A	None	Maintain			Only area known for of breeding in England
Narrow-leafed eelgrass <i>Zostera angustifolia</i>	Non-ENG	N/A	N/A	N/A	None	N/A			
<b>Site considerations</b>									
Connectivity					✓				
Geological/Geomorphological features of interest					✓				
Appropriate boundary					✓				
Areas of Additional Ecological Importance					✓*4				
Overlaps with existing MPAs					✓				

**Additional comments and site benefits:**

- The rMCZ site supports nationally important examples of high energy intertidal rock, intertidal biogenic reefs/ honeycomb worm reef, and intertidal underboulder communities (D. Mills 1998, Irish Sea Conservation Zones 2011). The rocky shores and biogenic reefs within the rMCZ have a long history of ecological research/study (Irish Sea Conservation Zones 2011).
- <sup>1</sup> The intertidal and infralittoral BSHs within this rMCZ do not reach the minimum viability criteria (5km), however due to the linear nature of the intertidal area and infralittoral zone, they are considered viable through their maximum diameter only.
- <sup>2</sup> Viability 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 included so is considered viable.
- <sup>3</sup>The adequacy target for FOCI habitat peat and clay exposures is met within the regional MPA network

- <sup>4</sup>This rMCZ supports nationally important seabird colonies on St. Bees Head SSSI which has over 10,000 pairs of breeding seabirds, mainly guillemots and kittiwakes and smaller numbers of razorbill, puffin and black guillemot. It represents the major seabird colony within the ISCZ project area. It is the only site in England to support breeding black guillemot (RSPB 2011).
- St Bees Head offers spectacular views over the Eastern Irish Sea and valuable interpretive opportunities for the MPA network.
- The rMCZ was extended to the south in order to encompass the full extent of Barn Scar and Kokoarrah Rocks which are particularly diverse in marine life (Irish Sea Conservation Zones 2011).
- The overall site will protect a very long section of contiguous intertidal habitats.

### Table 5. Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the 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 (welfare) derived from 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 H5.

Table 5a. Fish and shellfish for human consumption		rMCZ 11, Cumbrian Coast
Baseline	Beneficial impact	

Table 5a. Fish and shellfish for human consumption	rMCZ 11, Cumbrian Coast	
<p>Features to be protected by the rMCZ contribute to the delivery of fish and shellfish for human consumption (Fletcher and others (2012)). Fishing vessels using bottom trawls, pots and traps, mid-water trawls, nets, dredges, and hooks and lines are known to fish in the area; however, it is unlikely that all work in the intertidal area (the extent of this rMCZ). Intertidal fishers also collect mussels, clams and periwinkles by hand. See Table 2 for more detail.</p> <p><b>Recover:</b></p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in an unfavourable condition.</p> <p>Intertidal sand, muddy sand and mixed sediments are important spawning and nursery grounds (Fortes (2002) in Fletcher and others (2012)) for species including plaice (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)). Sole <i>Solea solea</i> and gadoids often visit sandy and mixed sediment (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)). Sandflats are frequented by sea bass and flounder as feeding grounds to predate on polychaetes and crustaceans, while migratory species such as salmon and shad pass through sandflat areas en route to other wetland habitats (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)).</p> <p>Infralittoral rock is a suitable habitat for inshore commercial fisheries species, particularly lobster and crab (Fletcher and others (2012)). Honeycomb worm reefs in the UK also provide attachment for seaweed communities (Hill (1998) in Fletcher and others (2012)). They stabilise mobile sediment, enabling sea bed species to establish communities (Holt and others (1998); Jones, Hiscock &amp; Connor (2000); both in Fletcher and others (2012)). and can bind unstable rocky ground, restricting drainage, which creates rock pool refuges for prawns, blennies and hermit crabs (Lancaster, 2008; in ISCZ (2011)).</p> <p>Juvenile bivalves are known to settle on polychaete tubes as they provide attachment surfaces (Bolam, 2003). The density of flatfish species such as plaice <i>Pleuronectes platessa</i> has been linked to the presence of reefs built by the polychaete <i>Lanica</i></p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. The abundance, size/age, biomass and recruitment of fish in the site are also expected to benefit. These benefits are expected to accrue as a result of reduced fishing mortality and reduction of gear interaction with the sea bed (see Annex L).</p> <p>It is assumed that the site will be closed to bottom trawls, dredges; and to hooks and lines, nets and pots, and traps and collection by hand in parts of the rMCZ. Therefore, there will be no benefits to fisheries from vessels using these gear types in the site. However, spill-over effects could generate benefits for vessels fishing just outside the rMCZ (Blythe and others, 2002; Reid, 2011; Bennett and Hough, 2007; Sweeting and Polunin, 2005; Partnership for Interdisciplinary Studies of Coastal Oceans (2011)). It is not possible to estimate the value to fishing vessels of this potential spill-over effect.</p> <p>The prohibition of bottom trawling and dredging from some parts of the site could potentially open up opportunities for static gear fisheries (where this is allowed to continue in the site) (see Annex L). There may be benefits for mid-water trawlers which will be allowed to continue fishing in the site but there is currently no evidence to support or refute this. It is not known whether pelagic species would benefit from the proposed fisheries restrictions.</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 style="text-align: center;">↑</p> <p>Confidence: Moderate</p>

Table 5a. Fish and shellfish for human consumption		rMCZ 11, Cumbrian Coast
<p><i>conchilega</i> (Rabaut (2010) in Fletcher and others (2012)).</p> <p><b>Maintain:</b></p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in a favourable condition.</p> <p>Intertidal rock habitats are important sources of larval plankton upon which commercially important fish species feed, including mussels and larval fish of plaice and mackerel (Fletcher and others (2012)).</p> <p>Underboulder areas may be important refuge areas for young crabs and juvenile lobsters at low tide. Boulders are also turned for the collection of periwinkles for human consumption (UK Biodiversity Partnership (2010) in Fletcher and others (2012)).</p>	<p><b>Possible changes in beneficial impacts due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective for the Black Guillemot (<i>Cepphus grille</i>) is changed from “maintain” to “recover”. This means that if the conservation objectives for features in this site are achieved, then some features will be maintained at favourable condition and some will be recovered to favourable condition.</p> <p>The Black Guillemot does not directly contribute to the provision of the ecosystem service of fish and shellfish for human consumption. This means that the achievement of the conservation objective of this feature will not change the benefits received from this ecosystem service over and above what is expected from the designation of the site and from the achievement of the conservation objectives of the other features.</p>	

Table 5b. Regulating services		rMCZ 11, Cumbrian Coast
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>	

Table 5b. Regulating services	rMCZ 11, Cumbrian Coast	
<p><b>Recover:</b></p> <p><b>Regulation of pollution:</b> The features of the site contribute to the recycling of waste and capture of carbon. Intertidal biogenic reefs also filter large volumes of water (Dubois (2006); Forster (1995); Rabaut (2010) in Fletcher and others (2012)). The filter feeding of biogenic reefs is such that they affect energy flow over a much wider area than the reef itself (Holt and others (1998) in Fletcher and others (2012)). They play a key role in organic matter processing and nutrient cycling (Holt and others (1998); Mermillod-Blondin (2003); both in Fletcher and others (2012)).</p> <p>Fundamental ecosystem processes including nutrient cycling are evident in intertidal sand and muddy sand (Fletcher and others (2012)). Active sulphur cycling was found to be more dynamic in sandy sediments than in muddy sediments (minutes rather than hours). Sulphate reduction has been reported as the most important process leading to a reflux of carbon dioxide into the water column (Al-Raei (2009) in Fletcher and others (2012)).</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems. The level of the service that is provided is related to the diversity and condition of species and habitats in the rMCZ, and the range of their sensitivity to different impacts.</p> <p>Infralittoral rock is extremely rich in faunal and floral species due to the range of habitats provided by kelp communities within the subtidal zone (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)). Muddy sand supports communities of polychaetes and bivalves, including the lugworm, cockles and may also have eelgrass (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)). In general, honey comb worm reefs increase the habitat complexity of the surrounding environment and provide microhabitats for other organisms in crevices and cavities (Hill (2010) in Fletcher and others (2012)).</p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in an unfavourable condition.</p> <p><b>Natural hazard protection:</b> Muddy shores (intertidal sand and muddy sand) are important for coastal protection, acting as buffers against incoming wave energy (Forster (2002) in Fletcher and others (2012)). Soft sediment intertidal habitats protect</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. Management of human activities in the site is expected to improve the condition and abundance of features in the site. Therefore, regulation of pollution services is anticipated to be of benefit.</p> <p>It is assumed that the site will be closed to bottom trawls, dredges; and to hooks and lines, nets and pots, and traps and collection by hand in parts of the rMCZ. Therefore, species richness could increase. In particular species such as seapens and brittle star may benefit as they have been found to be impacted on by bottom trawling (Greathead and others (2005); Adey and others (2006); Adey (2007); Kaiser and others (2000) in Blythe and others (2002)).</p> <p>Designating the rMCZ is also likely to protect the MCZ features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.</p> <p>If the conservation objectives of the features are achieved, the features will be maintained in a favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected.</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 style="text-align: center;">↑</p> <p>Confidence: Moderate</p>



Table 5b. Regulating services		rMCZ 11, Cumbrian Coast
	<p><b>Possible changes in beneficial impacts under Option 2 due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective for the Black Guillemot (<i>Cepphus grille</i>) is changed from “maintain” to “recover”. This means that if the conservation objectives for features in this site are achieved, then some features will be maintained at favourable condition and some will be recovered to favourable condition.</p> <p>The Black Guillemot does contribute to the provision of the ecosystem service. This means that the achievement of the conservation objective of this feature will not change the benefits received from regulating ecosystem services over and above what is expected from the designation of the site and from the achievement of the conservation objectives of the other features.</p>	

Table 5c. Recreation		rMCZ 11, Cumbrian Coast
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>	

Table 5c. Recreation	rMCZ 11, Cumbrian Coast	
<p>Numerous recreational activities take place up and down the Cumbrian coast within this rMCZ (angling, sailing, swimming, walking, bird watching, kite surfing etc.). Of particular relevance is St Bees Head. The Coast to Coast long-distance path begins/ends here and attracts in the region of 10,000 to 12,000 people annually. The RSPB (pers. comm., 2012) estimates that an additional 1,000 people visit St Bees Head each year because of its status as a nature reserve and to view the breeding sea bird colony on the cliffs. A charter boat offering wildlife-watching trips also visits the vicinity of St Bees Head.</p> <p>Fletcher and others (2012) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. In particular, blue mussel beds are noted as an important food source for birds such as knots, turnstones, sandpipers, herring gulls, crows and scoters (Nehls and Thiel (1993, cited in Tyler- Walters, 2008) in ISCZ 2011) which will benefit bird watchers.</p> <p>Intertidal mud and sandflats are important areas for shore birds and some wildfowl during the low water period and for diving ducks and fish during the high water period (Evans (1998) in Fletcher and others (2012)). Shore birds migrating from breeding to wintering grounds are important predators on sandflats in north-west Europe (UK sites include the Wash, Morecombe Bay, Poole Harbour and the Solent) (Jones, Hiscock &amp; Connor (2000) in Fletcher and others (2012)).</p> <p>The MCZ features will also provide biological processes that support various fish species which in turn will benefit anglers. Intertidal underboulder communities provide bait for anglers (Sewell (2005) in Fletcher and others (2012)). Rock pools are particularly important habitats of intertidal rock that attract visitors to the marine environment.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. Due to the ecological services of features to be recovered in the site (honeycomb worm reefs, intertidal sand and muddy sand), MCZ designation may lead to an increase, in time, of anglers and bird watchers to the site, which may benefit the local economy. Various studies demonstrate the local economic value of sea angling (Scottish Government, 2009; Invest in Fish South West, 2005); however, it has not been possible to quantify the potential impact for this rMCZ.</p> <p>Sea birds are known to attract visitors, which in turn generates local economic value. A study of four RSPB marine reserves has highlighted the fact that, on average, an estimated additional income of £300,000 a year can be generated and directly attributed to sea bird watching within a designated nature reserve (RSPB, 2010). On average, this has supported up to the equivalent of nine full-time jobs at each reserve. While this is the estimated local economic value generated in the absence of MCZs, it emphasises that MCZs could provide ecological benefits for sea birds which in turn could generate local economic value if sea bird numbers increase or are given more protection. However, it is not clear from the research if economic value is likely to increase with sea bird numbers or additional protection. It is, however, likely that a better quality of experience (i.e. more sea birds) would attract more visitors. Regardless, such impacts are likely to be local and represent a redistribution of sea bird watching rather than an overall increase in bird watchers nationally.</p> <p>The ecological and recreational benefits potentially provided by this rMCZ would complement Copeland Borough Council's coastal park programme. This aims to improve visitor facilities and experience of the marine environment while increasing visitor numbers, jobs and economic opportunity along the west Cumbrian coast. This will extend from Whitehaven to Millom.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: Moderate</p>


Table 5c. Recreation		rMCZ 11, Cumbrian Coast
<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 an unfavourable condition.</p>	<p><b>Possible changes in beneficial impacts under Option 2 due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective for the Black Guillemot (<i>Cepphus grille</i>) is changed from “maintain” to “recover”. This means that if the conservation objectives for features in this site are achieved, then some features will be maintained at favourable condition and some will be recovered to favourable condition.</p> <p>The achievement of the conservation objective for the Black Guillemot could benefit the population of this species in the rMCZ and surrounding areas. This could increase their visibility to wildlife watchers, thus improving the quality of the wildlife watching experience. However, it is not clear if this improvement will be over and above what is expected from the designation of the site or from the achievement of the conservation objectives of other features.</p>	

Table 5d. Research and education		rMCZ 11, Cumbrian Coast
Baseline	Beneficial impact <i>under Policy Option 1 and Policy Option 2</i>	

Table 5d. Research and education		rMCZ 11, Cumbrian Coast
<p>The extent of research undertaken in the site is not known. The intertidal areas, including the rocky shores and biogenic reefs, have been extensively studied by Lancaster (2010, in ISCZ, 2011) on behalf of NWIFCA for many years. Intertidal rocky shores are a classic focus for research, and there is a wealth of historical data regarding many aspects of ecology (Connell (1961) &amp; Paine (1969) in Fletcher and others (2012)). Such baseline data are extremely useful for exploring the impacts of environmental change (Hawkins (2009) in Fletcher and others (2012)). Rocky intertidal zones have been an active area of research because communities are well defined and accessible, and so can be easily and efficiently surveyed (Hill (1998) in Fletcher and others (2012)). Peat and clay exposures are an important archaeological resource which may potentially provide historical and environmental data about human activity.</p> <p>It is known that intertidal underboulder communities are used for education, research and nature watching. These activities take place in coastal areas with relatively easy access to the shore and generally involve overturning boulders to view the flora/fauna which live underneath. Many organisations, such as the Wildlife Trusts and the Marine Life Information Network (MarLIN), co-ordinate such activities for educational and research purposes for schools, community groups and tourists.</p>	<p>Monitoring of the rMCZ will help 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. It has not been possible to estimate the value derived from research activities associated with the rMCZ.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;">↑</p> <p>Confidence: High</p>
	<p><b>Possible changes in beneficial impacts under Option 2 due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective for the Black Guillemot (<i>Cepphus grille</i>) is changed from “maintain” to “recover”. This means that if the conservation objectives for features in this site are achieved, then some features will be maintained at favourable condition and some will be recovered to favourable condition.</p> <p>It is not clear if the achievement of the conservation objective of the Black Guillemot and other features in this site will change the benefits received from this ecosystem service.</p>	

Table 5e. Non-use and option values		rMCZ 11, Cumbrian Coast
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<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 rMCZ and the ecosystem services provided, even if they do not currently benefit from them.</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 (MPAs). 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 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>In the Marine Conservation Society's 'Your Seas Your Voice' campaign (Ranger and others, 2011), ten 'nominated sites' fall within the boundary of rMCZ 11. The nominations are mostly adjacent to St Bees Head, and were made by recreational users and professionals in the environment sector. The main reason given for protection of this site was the personal attachment these people feel towards this section of the UK coastline. One recreational sea user mentioned the importance of the area as a breeding ground for sea birds, citing this as a reason for protection. Professionals working in the environment sector recommended that the nominated sites protect the <i>Sabellaria</i> reef in the area. These are examples of the reasons why some people would like areas within this MCZ to be protected. The views presented here cannot be assumed to be representative of the UK's population and are subject to bias and gaps (for further details see Annex H).</p> <p>A survey of beach users in coastal areas of the north-west of England was undertaken in 2011 by liaison officers in the Irish Sea Conservation Zones Project Area. Of 19 members of the public who commented on the potential designation of rMCZ 11, 18 of them said it was a 'good' or 'very good' idea. Reasons stated included the need to conserve and protect marine biodiversity for future generations as long as this does not affect recreational use of the site.</p>	<p>Anticipated direction of change:</p>  <p>Confidence: Moderate</p>
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	<p><b>Possible changes in beneficial impacts under Option 2 due to change in conservation objectives</b></p> <p>SNCBs advise that the conservation objective for the Black Guillemot (<i>Cephus grille</i>) is changed from “maintain” to “recover”. This means that if the conservation objectives for features in this site are achieved, then some features will be maintained at favourable condition and some will be recovered to favourable condition.</p> <p>It is not clear if the achievement of the conservation objective of the Black Guillemot and other features in this site will change the benefits received from this ecosystem service.</p>	
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### Recommended Marine Conservation Zone (rMCZ) 14, Hilbre Island Group

**Site area (km<sup>2</sup>): 4.49**

- This site has been proposed for designation under both Policy Option 1 and Policy Option 2. Under Policy Option 2, this site is proposed for designation in 2013.

**Table 1. Site-specific benefits arising from the rMCZ (over 2013 to 2032 inclusive)**

Table 1. Conservation impacts	rMCZ 14, Hilbre Island Group
<b>1a. Ecological description</b>	
This site surrounds an archipelago of three islands – Little Eye, Middle Eye (also known as Little Hilbre) and Hilbre Island – at the mouth of the Dee Estuary, adjacent to the	

town of West Kirby on the Wirral peninsula. The islands are connected to the mainland at low tide, when they can be accessed by foot. This is a popular activity with tourists, especially in the summer months. The islands are surrounded to the north-west by a 5–10 metre deep channel which was formed towards the end of the last Ice Age. It overlaps with a Site of Special Scientific Interest (SSSI), a Special Area of Conservation (SAC), a Special Protection Area (SPA) and a local nature reserve. The site proposes protection of blue mussel *Mytilus edulis* beds and peat and clay exposures.

Peat and clay exposures are an irreplaceable habitat type, as they are composed of former lake bed sediments and ancient forested peatland (also referred to as 'submerged forests') (Maddock (2010) in ISCZ, 2011). Depending on the level of sand scour present, the surface of peat exposures can be covered with algal mats made of red and green seaweeds *Ceramium* sp. and *Ulva lactuca* and *Ulva intestinalis*. Hydroids can be present within small pools of water and crabs shelter within crevices, e.g. shore crabs *Carcinus maenas* and edible crabs *Cancer pagurus* (Maddock (2010) in ISCZ, 2011). On the surface of clay exposures there tends to be less seaweed coverage; instead, small clumps of blue mussels *Mytilus edulis* can be present, alongside barnacles and periwinkles *Littorina littorea*, while polychaete worms live within the clay, e.g. *Polydora* sp. and *Hediste diversicolor* (Maddock (2010) in ISCZ, 2011). Both peat and clay exposures are soft enough to be burrowed into by piddocks *Pholas dactylus*, and the holes created by these burrowing bivalves provides an important microhabitat for species such as crabs and anemones, e.g. the daisy anemone *Cereus pedunculatus* and the gem anemone *Aulactinia verrucosa* (Maddock (2010) in ISCZ, 2011).

Blue mussel beds support a varied biological community. They provide a stable, hard substrate in areas of otherwise soft sediments or unstable rocky ground; this underlies their ecological importance. They stabilise the sediment, forming hard structures to which other sessile (or immobile) organisms can attach. The crevices they create can give shelter to other animals, and the accumulated faeces and associated sediments are an important food source for other species (Holt and others (1998) in ISCZ, 2011).

There are a number of additional habitat Features of Conservation Importance (honeycomb worm *Saballaria alveolata* reefs, intertidal mudflats and estuarine rocky habitats) which also occur within this proposed site; however, as they already receive protection through the existing SSSI, SAC and SPA they are not included as a feature within this rMCZ.

Three studies in the 1970s recorded the seaweed communities present on the rocky shores of Hilbre Island (Russell (1972a, 1972b, 1977) in ISCZ, 2011). Due to a combination of the limited availability of rocky substrate and the large tidal range, the intertidal communities can be split between two zones: the higher shore level contains *Prasiola stipitata*, *Blidingia minima*, *Lyngbya* spp. – all green seaweeds which grow in patches on rocks – while, on the lower shore, the acorn barnacle *Elminius modestus* and *Fucus* sp., brown algae can be found (Russell (1972a) in ISCZ, 2011). Laminarians or kelp species which were historically present have disappeared from this area and this has been attributed to pollution and/or siltation from the estuary (Russell (1972a) in ISCZ, 2011). Source: ISCZ (2011).

1b. MCZ Feature Baseline and Impact of MCZ				
Feature	Area of feature (km <sup>2</sup> )	No. of point records	Baseline	Impact of MCZ
<i>Broadscale Habitats</i>				
Intertidal Biogenic Reefs	0.46	-	Unfavourable condition	Recover to favourable condition
<i>Habitats of conservation Importance</i>				
Blue Mussel Beds	0.02	3	Unfavourable condition	Recover to favourable condition

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Peat and Clay Exposures	0.02	1	Unfavourable condition	Recover to favourable condition
<b>Option 2:</b> This site is proposed for designation in 2013. Due to data confidence assessment for some features not being sufficient to designate at this stage, this site is initially proposed for designation for the features listed below. It is proposed that it will be designated for the other features at a later date. This means that initially costs and benefits may both be lower than listed below. Blue Mussel beds and Peat and clay exposures.				

**Table 2. Site-specific costs arising from the effect of the MCZ on human activities (over 2013 to 2032 inclusive)**

Table 2a. Archaeological heritage		rMCZ 14, Hilbre Island Group
<b>Source of costs of the rMCZ</b> 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. However, restrictions could also be placed upon archaeological excavation in areas of peat and clay exposures in the site.		
Baseline description of activity	Costs of impact of rMCZ on the sector <i>under Policy Option 1 and Policy Option 2</i>	
Over 10 wrecks 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 of one licence application could be in the region of £500 to £10,000 depending on the size of the MCZ (English Heritage, pers. comm., 2012). The impact on the UK economy is not likely to be significant. No further impacts on activities related to archaeology are anticipated. If archaeologists respond to restrictions on excavation in areas of peat and clay exposures 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 (IA). If archaeological excavations do not take place as a result of this restriction, this will prevent interpretation of archaeological evidence from the site which will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.	

Table 2b. Commercial fisheries	rMCZ 14, Hilbre Island Group
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Table 2b. Commercial fisheries		rMCZ 14, Hilbre Island Group
<p><b>Source of costs of the rMCZ</b></p> <p>The Joint Nature Conservation Committee (JNCC) and Natural England have advised that there is considerable uncertainty about whether additional management of bottom trawling, hooks and lines, nets, pots and traps and the use of hooks and lines will be required for certain features potentially protected by the rMCZ. Therefore, two scenarios have been employed in the IA for these fisheries to reflect this uncertainty: no additional management, and closure of the fishery within the site. Should the site be designated, the management required will fall somewhere within this range.</p> <p><b>Management scenario 1:</b> Entire rMCZ is open to all gear types.</p> <p><b>Management scenario 2:*</b> Closure of areas of blue mussel beds for hand collection of shellfish and bait digging.</p> <p><b>Management scenario 3:**</b> Closure of areas of peat and clay exposures to bottom trawls, hooks and lines and nets, and collection by hand.</p> <p>* This is the management scenario identified by the vulnerability assessment using information collected from stakeholders.</p> <p>** Natural England and JNCC advise that bottom trawls, hooks and lines and nets, and collection by hand need to be managed in the vicinity of peat and clay exposures only, but for ease of analysis, and as the locations of peat and clay exposures are not fully known at this time, the loss of landings estimate represents the loss of landings from the entire rMCZ. As such, the estimate of landings affected will be an overestimate.</p>		
<p><b>Summary of all UK commercial fisheries:</b> The site lies completely within the 6 nautical mile (nm) line. A number of commercial fishing restrictions are already in existence (listed in Annex E). Of approximately 700 UK vessels that are known to be active in the Irish Sea Conservation Zones (ISCZ) Project Area (MMO, 2007–10), at least 11 UK vessels are known to fish in the vicinity of rMCZ 14 (under 15 metre vessels only) (ISCZ, 2010). The vessels mostly beam trawl for shrimp and whitefish in the channel between Hilbre Island and the West Hoyle sandbank (which is outside of the rMCCZ) but very little activity, if any, takes place in rMCZ 14 itself and in the vicinity of the sensitive habitats (North Wales and Wirral fishers, pers. comm., 2011). The gear used is lighter than conventional offshore beam trawling gear (Stakeholder Focus Meeting, 2011). There is no evidence for the use of dredges or pots and traps in the site. At least seven fishers are known to regularly hand-pick in and around the site for mussel and cockle (ISCZ, 2010); however, this depends on the occurrence of mussel and cockle spat and when the beds are opened to harvesting. At such times, the numbers of fishers hand-picking in the site can greatly increase. The estimated total value of UK landings from the site is £0.057m/yr (including shellfish collected by hand), but in years when shellfish spats occur and the beds are opened for commercial gathering the value can increase to £5m to £10m/yr (based on an internet search for media reports covering the last ten years). This is provided for each affected gear type below.</p> <p>It should be noted that the Liverpool Special Protection Area (SPA) overlaps with rMCZ 14. It is not yet known what the fisheries restrictions for the SPA will be but the management scenarios employed in the IA for the SPA were no additional restrictions (minimum scenario) or the maximum scenario:</p> <ul style="list-style-type: none"> <li>• Closure of high density areas of common scoter to beam trawling and dredging as well as reduction in effort for gears targeting the prey of common scoter.</li> <li>• Seasonal closure of high density areas of red-throated diver to specified nets, beam trawling and dredging as well as reduction in effort for gears targeting the prey of red-throated divers.</li> </ul> <p>It is not known for the purposes of this IA, if high density areas of either common scoter or red-throated diver are located within rMCZ 14.</p>		
Baseline description of UK commercial fisheries		Costs of impact of rMCZ on UK commercial fisheries under Policy Option 1 and Policy Option 2
<p><b>Bottom trawls:</b> At least seven vessels are known to use beam trawls in the site, targeting shrimp, sole, plaice, flounder, turbot, and skate and ray</p>		The annual value of UK landings affected is estimated to fall within the following range:

Table 2b. Commercial fisheries		rMCZ 14, Hilbre Island Group			
<p>throughout the year (ISCZ, 2010). The vessels mostly beam trawl for shrimp and whitefish in the channel between Hilbre Island and the West Hoyle sandbank but very little activity, if any, takes place in rMCZ 14 itself and in the vicinity of the sensitive habitats (North Wales and Wirral fishers, pers. comm., 2011). The gear used is lighter than conventional offshore beam trawling gear (Stakeholder Focus Meeting, 2011). Beam trawling in the vicinity of rMCZ 14 is very important to the local community and has been taking place for hundreds of years. This is because generations of approximately nine local families depend on the fishing for their livelihoods. Consequently, this fishing activity is of very local significant economic and social importance (North Wales fisher, pers. comm., 2011).</p> <p>The estimated value of landings from the site is £0.001m/yr.</p>	£m/yr		Scenario 1	Scenario 2	Scenario 3
	Value of landings affected		0.000	0.000	0.001
	<p><b>Scenario 3:</b> Closure of the site to beam trawling could impact on the nine local families that fish in the vicinity of the rMCZ.</p> <p>Stakeholders have not provided a description of impact. In establishing the draft conservation objectives, sensitive features in the rMCZ may have been 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.</p>				
<p><b>Hooks and lines:</b> Fewer than five vessels are known to use static lines in the site to target bass throughout the year (ISCZ, 2010).</p> <p>The estimated value of landings from the site is &lt;£0.001m/yr.</p>	The annual value of UK landings affected is estimated to fall within the following range:				
	£m/yr		Scenario 1	Scenario 2	Scenario 3
	Value of landings affected		0.000	0.000	<0.001
<p>Stakeholders have not provided a description of impact. In establishing the draft conservation objectives, sensitive features in the rMCZ may have been 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>					
<p><b>Nets:</b> At least ten vessels known to use nets in the site (ISCZ, 2010). They use gill nets, trammel nets, drift nets and tangle nets to target bass, sole, flounder, mullet, plaice and salmonid throughout the year.</p> <p>The estimated value of landings from the site is &lt;£0.001m/yr.</p>	The annual value of UK landings affected is estimated to fall within the following range:				
	£m/yr		Scenario 1	Scenario 2	Scenario 3
	Value of landings affected		0.000	0.000	<0.001
<p>Though the impact on the UK economy is not likely to be significant, the impacts on individual fishers could be significant. Stakeholders have not provided a description of impact. In establishing the draft conservation objectives, sensitive features in the rMCZ may have been 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</p>					

Table 2b. Commercial fisheries		rMCZ 14, Hilbre Island Group																		
		range, and is likely to be less restrictive than that required for other gears.																		
<p><b>Hand collection of shellfish and bait digging:</b> Fewer than five intertidal fishers are known to pick mussel in the site (ISCZ, 2010). The North Western Inshore Fisheries and Conservation Authority (NWIFCA) believes there to be little or no commercial picking in the site. The activity is managed by NWIFCA.</p> <p>The estimated value of landings from the site is £0.055m/yr (MCZ Fisheries Value Model).</p> <p>The FisherMap data for intertidal fisheries are the best available data. However, confidence in the data is low as, on the one hand, they are overestimates because the fishing grounds mapped by fishers represent areas greater in size than the rMCZ and will include values for nearby valuable cockle and mussel fishery areas. On the other hand, not every intertidal fisher has been interviewed, although we estimate about 30% of regular north-west of England intertidal fishers provided data. It should also be noted that values are only indicative due to the inherent unpredictability of where and when cockle and mussel spats will occur, and whether they will be opened for harvesting. Also, because the numbers of people attracted to cockle and mussel beds when they are opened is so unpredictable and difficult to manage, the real economic value of these beds is very hard to estimate. In the north-west of England waters, trends indicate that usually one large bed is opened once every four to five years, each worth in the region of £5m to £10m/yr (based on an internet search for media reports covering the last ten years).</p>		<p>The annual value of UK landings affected is estimated 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></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.055</td><td>0.055</td></tr></table> <p>Though the impact on the UK economy is not likely to be significant, the impacts on individual fishers could be significant. Stakeholders have not provided a description of impact. In establishing the draft conservation objectives, sensitive features in the rMCZ may have been assessed as having low vulnerability to collection by hand 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	Value of landings affected	0.000	0.055	0.055							
£m/yr	Scenario 1	Scenario 2	Scenario 3																	
Value of landings affected	0.000	0.055	0.055																	
Total direct impact on UK commercial fisheries under Policy Option 1 and Policy Option 2																				
		<p>The annual value of UK landings and gross value added (GVA) affected is estimated 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>Best estimate</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.055</td><td>0.056</td><td>0.004</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.025</td><td>0.026</td><td>0.002</td></tr></table>				£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate	Value of landings affected	0.000	0.055	0.056	0.004	GVA affected	0.000	0.025	0.026	0.002
£m/yr	Scenario 1	Scenario 2	Scenario 3	Best estimate																
Value of landings affected	0.000	0.055	0.056	0.004																
GVA affected	0.000	0.025	0.026	0.002																

Table 2b. Commercial fisheries		rMCZ 14, Hilbre Island Group
	<p>The best estimate is based on an assumption of 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>At least ten vessels and five intertidal fishers are likely to be affected (ISCZ, 2010). In years when there is significant mussel spat which is opened for harvesting, the numbers of intertidal fishers affected will be much greater. Some vessels fishing in the site use more than one gear type. Where there is evidence of this (from Fisherman or MMO (2011b)), duplication has been removed so that the number below represents the minimum number of vessels fishing in the site impacted under each scenario:</p> <p>Scenario 1: 0 Scenario 2: 0 Scenario 3: 10</p>	
Baseline description of non-UK fisheries	<b>Costs of impact of rMCZ on non-UK commercial fisheries under Policy Option 1 and Policy Option 2</b>	
<b>Impact on non-UK commercial fisheries:</b> There is no evidence of non-UK vessels working in this site (MMO, 2011a).	None.	

Table 2c. Ports, harbours, shipping and disposal sites		rMCZ 14, Hilbre Island Group		
<b>Source of costs of the rMCZ</b>				
<b>Management scenario 1:</b> Not applicable to this site.				
<b>Management scenario 2:</b> Increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ. This applies to future navigational dredging, disposal of dredge material and port developments. It is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed for port developments or port-related activities due to this rMCZ relative to the baseline.				
Baseline description of activity		Costs of impact of rMCZ on the sector <i>under Policy Option 1 and Policy Option 2</i>		
<b>Disposal sites:</b> There are three disposal sites within 5km of the rMCZ (Dee Estuary, Mostyn Deep, Mostyn Deep (maintenance)). These are associated with the ports of Mostyn and the Dee Estuary. The sum of the average number of licence applications received for all of these disposal sites in total is 0.5 per year (based on number of licence applications				
		£m/yr	Scenario 1	Scenario 2
		Cost to the operator	0.000	0.004*
* 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				

Annex I2. Site specific *Impact Assessment materials (Option 2)*

<p>received between 2001 and 2010 (Cefas, pers. comm., 2011).</p> <p><b>Port development:</b> The port of Hoylake is within 5km of the rMCZ. No port developments are known to be planned within the 20-year period of the IA.</p>	<p>assumptions to those used to estimate costs at a regional level and for the entire suite of sites. See Annex H12 for further information.</p> <p><b>Scenario 1:</b> Not applicable.</p> <p><b>Scenario 2:</b> Future licence applications for disposal of dredged material and port or harbour development plans or proposals within 5km of the rMCZ will need to consider the potential effects of the activity on the features protected by the rMCZ. Sufficient information is not available to identify whether any additional mitigation of impacts on features protected by the MCZ will be needed for proposed future port and harbour developments relative to the mitigation provided in the baseline. Unknown potentially significant costs of mitigation could arise.</p>
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Table 2d. Recreation		rMCZ 14, Hilbre Island Group
<b>Source of costs of the rMCZ</b>		
<b>Management scenario 1:</b> Prohibition of recreational activities in areas of peat and clay exposures and blue mussel beds.		
Baseline description of activity	Costs of impact of rMCZ on the sector under Policy Option 1 and Policy Option 2	
Many thousands of tourists each year walk across at low tide to Hilbre Island. Horse riders sometimes go across to Hilbre Island also. Rockpooling is popular in some parts of the island. These activities mostly take place away from the present known location of the blue mussel beds and peat and clay exposures. However, some recreational activities may take place on these features and could impact on the features. The area of peat and clay exposures in this site is fairly contained. Information was not available on the types of activities that currently take place in areas of peat and clay exposures and blue mussel beds. (North West Coastal Forum, pers. comm., 2011).	The level of recreational activity taking place in the area of the peat and clay exposures and the blue mussel beds in the site is low. It may be difficult to enforce prohibition of recreational activities in the area of peat and clay exposures and blue mussel beds in the site. It is more likely that activities will be discouraged (through the use of signs) in the areas of these sensitive features. It is assumed that participants in recreational activities will respond to the signs by carrying out their activities elsewhere in the site, or along the coast and that this will have a negligible impact on the participants and the quality of their recreational experience. Costs of signs are included in assessment of management costs (see Annex N).	

Table 2e. Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ 14, Hilbre Island Group
<b>Cables (interconnectors and telecom cables)</b>	
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 H6 and Annex N3 (they are not assessed for this site alone).	

**Table 3. 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 <i>under Policy Option 1 and Policy Option 2</i> (existing activities at their current levels and future proposals known to the regional MCZ projects)									rMCZ 14, Hilbre Island Group
Existing cables (telecom cables), flood and coastal erosion risk management (coastal defence) and water pollution from activities on land. The IA assumes that no additional mitigation of impacts of water abstraction, discharge or diffuse pollution will be required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process (based on advice provided by 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 <sup>34</sup> ✓ = 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 14, Hilbre Island Group
ENG Feature	Represent- ativity	Replicatio n	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
A2.7 Intertidal biogenic reefs	BSH	✓	✓	X * <sup>1</sup>	None	Recover			
Blue mussel <i>Mytilus edulis</i> beds	FOCI Habitat	✓	✓	✓ * <sup>2</sup>	None	Recover			

<sup>34</sup> copied from the JNCC and Natural England's advice to Defra on rMCZs

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Peat and clay exposures	FOCI Habitat	✓	✓	✓	None	Recover			
<b>Site considerations</b>									
Connectivity				✓					
Geological/Geomorphological features of interest				None					
Appropriate boundary				✓					
Areas of Additional Ecological Importance				NA					
Overlaps with existing MPAs				✓					

**Additional comments and site benefits:**

- <sup>1</sup> This site does not meet the minimum viability criteria (5km<sup>2</sup>) for the BSH Intertidal biogenic reefs, and is therefore considered unviable. However, this site was primarily recommended for the two FOCI.
- <sup>2</sup> Viability 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 included so is considered viable.

**Table 5. Anticipated benefits to ecosystem services**

The habitats, species and other ecological features of the 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 (welfare) derived from 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 H5.

Table 5a. Fish and shellfish for human consumption		rMCZ 14, Hilbre Island Group
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	


Table 5a. Fish and shellfish for human consumption	rMCZ 14, Hilbre Island Group	
<p>Features to be protected by the rMCZ contribute to the delivery of fish and shellfish for human consumption (Fletcher and others (2012)). Fishing vessels in the site mostly beam trawl for shrimps and whitefish in the channel between Hilbre Island and the West Hoyle sandbank but very little activity, if any, takes place in rMCZ 14 itself (North Wales &amp; Wirral fishers, pers. comm., 2011). The gear used is lighter than conventional offshore beam trawling gear (Stakeholder Focus Meeting, 2011). There is no evidence for the use of dredges or pots and traps in the site. Intertidal fishers hand-pick in and around the site for mussels and cockles (ISCZ, 2010). See Table 2 for more detail.</p> <p>Biogenic reefs provide habitat for shellfish and fish, such as temperate rocky reef fish (Gunderson &amp; Vetter (2006) in Fletcher and others (2012)). They are also likely to support shrimp fishing (Holt and others (1998) in Fletcher and others (2012)) and bivalves spats such as mussels, cockles and scallops (OSPAR (2008), Bolam (2003); both in Fletcher and others (2012)). Biogenic reefs also support crabs, lobsters, queen scallops and other crevice-dwelling fauna (Hill (1998) in Fletcher and others (2012); Lancaster (2008) in ISCZ (2011)).</p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in an unfavourable condition.</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to a favourable condition. The abundance, size/age, biomass and recruitment of fish in the site are also expected to benefit. These benefits are expected to accrue as a result of reduced fishing mortality and reduction of gear interaction with the sea bed (see Annex L).</p> <p>It is assumed that the site will be closed to either hand-picking around the blue mussel beds or prohibition of bottom trawls, hooks and lines, nets and collection by hand around peat and clay exposures respectively. Therefore, there will be no benefits to fishers using these gear types in these parts of the site. However, spill-over effects could generate benefits for vessels fishing within or just outside the rMCZ (Blythe and others, 2002; Reid, 2011; Bennett and Hough, 2007; Sweeting and Polunin, 2005; Partnership for Interdisciplinary Studies of Coastal Oceans (2011)). However, due to the size of the areas where fishing is likely to be restricted, and the likelihood that little fishing, if any, currently takes place in these parts of the site, the anticipated benefits to fisheries is minimal. The blue mussel beds are already managed by the North Western Inshore Fisheries and Conservation Authority (NWIFCA). It is not possible to estimate the value to fishing vessels of this potential spill-over effect.</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, additional 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. Regulating services	rMCZ 14, Hilbre Island Group	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p><b>Regulation of pollution:</b> The features of the site contribute to the recycling of waste and capture of carbon. Intertidal biogenic reefs also filter large volumes of water (Dubois (2006); Forster (1995); Rabaut (2010) in Fletcher and others (2012)). The filter feeding of biogenic reefs</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition. Management of human activities in the site is expected to improve the condition and abundance of features in the site. Therefore, regulation of pollution services is anticipated to be of benefit.</p>	<p>Anticipated direction of change:</p> <p style="text-align: center;"></p>



Table 5b. Regulating services	rMCZ 14, Hilbre Island Group	
<p>is such that they affect energy flow over a much wider area than the reef itself (Holt and others (1998) in Fletcher and others (2012)). They play a key role in organic matter processing and nutrient cycling (Holt and others (1998); Mermillod-Blondin (2003); both in Fletcher and others (2012)).</p> <p><b>Environmental resilience:</b> The features of the site contribute to the resilience and continued regeneration of marine ecosystems. The level of the service that is provided is related to the diversity and condition of species and habitats in the rMCZ, and the range of their sensitivity to different impacts.</p> <p>Biogenic reefs increase the habitat complexity of the surrounding environment and provide microhabitats for other organisms in crevices and cavities (Hill (2010) in Fletcher and others (2012)). Blue mussel beds in areas of soft sediment provide an area of hard substrata (Hill, 2010) and create complex habitats that provide refuge for a range of flora and fauna not observed on surrounding sediments (Hill (2010) in Fletcher and others (2012)).</p> <p>The baseline quantity and quality of the ecosystem service provided is assumed to be the same as that provided by the features of the site when in an unfavourable condition.</p> <p><b>Natural hazard protection:</b> Biogenic reefs help to reduce wave energy and so help to protect coastlines from erosion (McManus (2001), Riding (2002); both in Fletcher and others (2012)).</p>	<p>Designating the rMCZ is also likely to protect the MCZ features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.</p>	<p>Confidence: Moderate</p>

Table 5c. Recreation	rMCZ 14, Hilbre Island Group	
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
<p>Many thousands of tourists each year walk across at low tide to Hilbre Island. Horse riders also sometimes cross to the island. Rockpooling is popular in some parts of the island. The concentration of these activities</p>	<p>If the conservation objectives of the features are achieved, the features will be recovered to favourable condition.</p>	<p>Anticipated direction of change:</p>

Annex I2. Site specific *Impact Assessment materials (Option 2)*

Table 5c. Recreation		rMCZ 14, Hilbre Island Group
<p>take place away from the present known location of the blue mussel beds and peat and clay exposures.</p> <p>Fletcher and others (2011) report that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. In particular, blue mussel beds are noted as an important food source for birds such as knots, turnstones, sandpipers, herring gulls, crows and scoters (Nehls and Thiel (1993, cited in Tyler- Walters, 2008) in ISCZ, 2011) which will benefit bird watchers.</p> <p>The MCZ features (e.g. intertidal biogenic reefs) will also provide biological processes that support various fish species that in turn will benefit anglers.</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 an unfavourable condition.</p>	<p>Due to the ecological services of features to be recovered in the site, MCZ designation may lead to an increase, in time, of anglers and bird watchers to the site, which may benefit the local economy. Various studies demonstrate the local economic value of sea angling (Scottish Government, 2009; Invest in Fish South West, 2005); however, it has not been possible to quantify the potential impact for this rMCZ.</p> <p>Sea birds are known to attract visitors, which in turn generates local economic value. A study of four Royal Society for the Preservation of Birds (RSPB) marine reserves has highlighted the fact that, on average, an estimated additional income of £300,000 a year can be generated and directly attributed to sea bird watching within a designated nature reserve (RSPB, 2010). On average, this has supported up to the equivalent of an additional nine full-time jobs at each reserve. While this is the estimated local economic value generated in the absence of MCZs, it emphasises that MCZs could provide ecological benefits for sea birds which in turn could generate local economic value if sea bird numbers increase or are given more protection. However, it is not clear from the research if economic value is likely to increase with sea bird numbers or additional protection. It is, however, likely that a better quality of experience (i.e. more sea birds) would attract more visitors. Regardless, such impacts are likely to be local and represent a redistribution of sea bird watching rather than an overall increase in bird watchers nationally.</p> <p>The ecological and recreational benefits potentially provided by this rMCZ would complement the existing Hilbre Nature Reserve which overlaps with the rMCZ. As the site is already part of the Dee Estuary SAC and Hilbre Island Nature Reserve, the anticipated additional benefits of this rMCZ are minimal.</p>	<p>↔</p> <p>Confidence: Moderate</p>

Table 5d. Research and education		rMCZ 14, Hilbre Island Group
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	


Table 5d. Research and education		rMCZ 14, Hilbre Island Group
The extent of research undertaken in the site is not known. Peat and clay exposures are an important archaeological resource which may potentially provide historical and environmental data about human activity.	Monitoring of the rMCZ will help 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. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	Anticipated direction of change:  Confidence: High


Table 5e. Non-use and option values		rMCZ 14, Hilbre Island Group
Baseline	Beneficial impact under Policy Option 1 and Policy Option 2	
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.	<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 (MPAs). 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 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>In the Marine Conservation Society's 'Your Seas Your Voice' campaign (Ranger and others, 2011), three 'nominated sites' fall within the boundary of rMCZ 14. Nominations were made by recreational users who cited the presence of 'whales, dolphins, seals and sharks' and the spectacular scenery of the site as reasons for protecting the it. These are examples of the reasons why some people would like areas within this MCZ to be protected. The views presented here cannot be assumed to be representative of the UK's population and are subject to bias and gaps (for further details see Annex H).</p> <p>A survey of beach users in coastal areas of the north-west of England was</p>	Anticipated direction of change:  Confidence: Moderate

Table 5e. Non-use and option values	rMCZ 14, Hilbre Island Group
	<p>undertaken in 2011 by liaison officers in the Irish Sea Conservation Zones Project Area. Of five members of the public who commented on the potential designation of rMCZ 14, three said it was a 'good' or 'very good' idea. Reasons stated included the need to conserve and protect marine biodiversity, in particular birdlife.</p>