Annex I1 Impacts of individual recommended Marine Conservation Zones (Balanced Seas) Part 3

Contents

1 Introduction

1.1.1 This annex sets out the direct impacts of each of the Balanced Seas recommended Marine Conservation Zones (rMCZs) and rMCZ Reference Areas. The rMCZs and rMCZ Reference Areas are presented in geographical order, split over the three separate documents. The reference list for all three documents can be found at the end of document three.

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

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

2 Impact Assessment

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

rMCZ 20 The Needles

Site area (km^2): 11.01

Table 1. Conservation impacts — **rMCZ 20, The Needles**

1a. Ecological description

This recommended Marine Conservation Zone (rMCZ) would protect some good examples of seagrass beds and the only regional example of one of the rare stalked jellyfish species. The site includes The Needles, a row of three distinctive stacks of chalk off the western extremity of the Isle of Wight. Most of the rMCZ comprises low-energy infralittoral rock covered with a thin veneer of mixed sediments, with infralittoral mixed sediment dominating in the deeper areas. Seagrass beds, occurring in Alum, Colwell and Totland Bays, are important for breeding sea hares. Colwell Bay is home to the seaweed, peacock's tail, which in the Balanced Seas Project Area is found off the Isle of Wight alone. Alum Bay is home to sea squirt beds and sea anemones. Sea birds feed throughout the subtidal areas of the site and the area is a particularly important foraging ground for black-headed gull and great cormorant. Overall, the area is thought to be highly productive biologically and in addition to the species above, a range of fish species (e.g. smelt, bass, smooth hound and sole), crustaceans (e.g. lobster) and molluscs (e.g. whelk) are known to occur here. This site partially overlaps the South Wight Maritime Special Area of Conservation.
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
Broad-scale habitats				
A5.4 Subtidal mixed sediments	10.58	-	Favourable condition	Maintain at favourable condition
Habitats of conservation importance				
Seagrass beds		3004 records	Unfavourable condition	Recover to favourable condition
Species of conservation importance				
Stalked Jellyfish (*Lucernariopsis campanulata*)		1 record	Favourable condition	Maintain at favourable condition
Peacock's Tail (*Padina pavonica*)		12 records	Favourable condition	Maintain at favourable condition

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

Table 2a. Archaeological heritage — **rMCZ 20, The Needles**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

Table 2a. Archaeological heritage	**rMCZ 20, The Needles**
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 sea grass.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Wrecks of vessels of British, Dutch, Greek, Prussian, Portuguese, Swedish, Italian and French origin are recorded within the site. The Needles' designated wreck site is thought to comprise two wrecks (HMS *Assurance* and HMS *Pomone*) and is protected by a 75 metre exclusion zone. A German World War II aircraft is also recorded within the site (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. If archaeologists respond to restrictions on anchoring over areas of sea grass 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.

Table 2b. Commercial fisheries	**rMCZ 20, The Needles**
Source of costs of the recommended Marine Conservation Zone (rMCZ) The Joint Nature Conservation Committee 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 for these fisheries to reflect this uncertainty. Should the site be designated, the management that will be required will fall somewhere within this range. ***Management scenario 1:*** Zoned closure of rMCZ to bottom trawls and dredges at a 2 metre depth contour along the shoreline to protect areas of sea grass bed (Statutory Nature Conservation Bodies (SNCB) informed scenario).	

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 20, The Needles</th></tr>
<tr><td colspan="2">Management scenario 2: Closure of rMCZ to bottom trawls, dredges, nets, lines, pots and traps to protect areas of sea grass bed (SNCB informed scenario).</td></tr>
<tr><td colspan="2">Summary of all fisheries: This site is wholly within the 6nm (nautical mile) limit and is fished only by UK vessels. The main fleets are based at Keyhaven, Lymington and Yarmouth and are indicated as being under 15 metres in length (MCZ Fisheries Model). The main fishing activities are cuttlefish trapping (effort in this fishery is increasing because cuttlefish is a non-quota species), potting for lobsters, crabs and whelks, gill netting for bass and mullet, long lining for bass and mullet, and tangle/trammel netting for sole and plaice. Trawling and oyster dredging effort is very limited. An Inshore Fisheries and Conservation Authority (IFCA) byelaw prohibits fishing by vessels over 12 metres in size within 6nm, which covers the entire site (Southern IFCA, feedback response to first tranche of IA material, 16 January 2012). A number of other commercial fishing restrictions are also in existence (listed in Annex E1). The Southern IFCA is currently developing a Seagrass Management Strategy which will include a voluntary code of conduct that closes areas of sea grass to bottom trawls and dredges around the Isle of Wight (from mean high water out to a distance that is currently being determined) (Jury, J. from Southern IFCA email., 24 April 2012; The SIFCA and the Seagrass Working Group (SWG). 2012.). This will deliver part of the management that would be required under scenarios 1 and 2. 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: £0.032m/yr.</td></tr>
<tr><th>Baseline description of UK commercial fisheries</th><th>Costs of impact of rMCZ on UK commercial fisheries</th></tr>
<tr><td>Bottom trawls: Numbers of vessels are unknown.

Estimated total value of landings from the rMCZ: £0.004m/yr (MCZ Fisheries Model).</td><td>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>0.001</td><td>0.004</td></tr>
</table>
In establishing the draft conservation objectives, the site's feature 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 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.
The above values are likely to be over estimates because implementation of the Southern IFCA Seagrass Management Strategy to protect areas of sea grass through a voluntary code of conduct will significantly reduce the activity of bottom trawls in this rMCZ (Jury, J. from Southern IFCA email, 24 April 2012).</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 20, The Needles</th></tr>
<tr><td>Dredges: Estimated total value of landings from the rMCZ: £0.002m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK dredge 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><0.001*</td><td>0.002</td></tr>
</table>
* £450
In establishing the draft conservation objectives, the site's feature 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 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.

The above values are likely to be overestimates as the implementation of the Southern IFCA Seagrass Management Strategy to protect areas of sea grass through a voluntary code of conduct will significantly reduce the activity of dredges in this rMCZ (Jury, J., Southern IFCA email., 24 April 2012)</td></tr>
<tr><td>Pots and traps: Estimated total value of landings from the rMCZ: £0.016m/yr (MCZ Fisheries Model).</td><td>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>0.016</td></tr>
</table>
In establishing the draft conservation objectives, the site's feature 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.</td></tr>
<tr><td>Hooks and lines: Estimated total value of landings from the rMCZ: £0.001m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line 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>0.001</td></tr>
</table>
In establishing the draft conservation objectives, the site's feature may have</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 20, The Needles</th></tr>
<tr><td></td><td>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 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.</td></tr>
<tr><td>Nets: Estimated total value of landings from the rMCZ: £0.003m/yr (MCZ Fisheries Model).</td><td>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>0.003</td></tr></table></td></tr>
<tr><th>Total direct impact on UK commercial fisheries</th><th></th></tr>
<tr><td></td><td>The estimated annual value of UK landings and gross value added (GVA) 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>0.001</td><td>0.026</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.012</td></tr></table>
These values are likely to be overestimates due to the future implementation of the Southern IFCA Seagrass Managment Strategy to protect areas of sea grass through a voluntary code of conduct which will close areas of sea grass to bottom trawls and dredges around the Isle of Wight. (Southern IFCA, feedback response to first tranche of IA material, 16 January 2012).</td></tr>
<tr><th>Baseline description of non-UK fisheries</th><th>Costs of impact of rMCZ on non-UK commercial fisheries</th></tr>
<tr><td></td><td>None.</td></tr>
</table>

Table 2c. National defence **rMCZ 20, The Needles**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

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

Baseline description of activity	Costs of impact of rMCZ on the sector
MOD is known to make use of the site through amphibious activities.	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 20, The Needles**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

Management scenario 1: 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 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.

Management scenario 2: 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 to update the existing MDP for Yarmouth to assess impacts of activities on MCZ features. 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
Disposal sites: There is one site (WI080 Hurst Fort) within 1km of the rMCZ which is licensed for disposal of channel dredge material. This is used by the ports of Yarmouth and Lymington (Lisher, 2011). The average number of licence applications received for this disposal site is 2.9 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011). There are 2 sites (WI080 Hurst Fort and WI090 The Needles) within 5km	*£m/yr* / Scenario 1 / Scenario 2 Cost to the operator / 0.022 / 0.091* * 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

Table 2d. Ports, harbours, shipping and disposal sites	**rMCZ 20, The Needles**
of the rMCZ which are licensed for disposing of channel dredge material. The average number of licence applications received for both of these disposal sites is 12.8 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011). ***Navigational dredge areas:*** Navigational dredging occurs within 1km. 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. Navigational dredging occurs within 5km of the 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 this navigational dredge area is covered by an MDP, it is assumed that the assessment of environmental impact is not changed over the 20 year period of the IA. ***Port development:*** There is one port, Yarmouth, within 5km of the rMCZ which may undergo development in the future. The cross-Solent car ferry that operates between Lymington and Yarmouth (currently operated by Wightlink) is essential to the economy not only of Yarmouth and West Wight, but also the economy of the island as a whole. Some 25% of traffic to the island and over 1 million people per year pass through Yarmouth Harbour on their way to or from the island. The ferry service provides 40% of the Harbour's income (Lisher, C. email, feedback response to first tranche of IA material, 6 January 2012) However, no port developments are known to be planned within the 20 year period of the Impact Assessment (IA).	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 ***Scenario 1:*** 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). ***Scenario 2:*** Future licence applications for disposal of material, navigational dredging and port or harbour 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). An additional cost will arise to update the existing MDP to consider the potential effects of activities on the features protected by the rMCZ. The anticipated additional in the MDP is estimated to be a one-off cost of £8438.

Table 2e. Renewable energy – tidal energy **rMCZ 20, The Needles**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

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

Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and provision of additional mitigation of impacts of cabling (relative to the mitigation provided in the baseline).

Baseline description of activity	**Costs of impact of rMCZ on the sector**
The rMCZ is adjacent to the Solent Energy Nearshore deployment site which has a potential capacity of 1MW and is scheduled for development by 2015. It is part of the tidal energy project thatis being implemented by the Solent Ocean Energy Centre (SOEC), which plans to install capacity of a total of 21MW around the Isle of Wight (it has started initial trials) (Balanced Seas Final Reccomendations Report, 2011; SOEC, 2011; Merry, S. from Renewable Energy Association (REA) feedback response to 1st tranche of material., 13 January 2012). The Isle of Wight Council has indicated that this is one of the few areas in the UK where tidal energy technology could be implemented (Fawcett. J from Isle of Wight Council, email., 7 March 2012.., March 2012). It is assumed for the purpose of the Impact Assessment (IA) that there would be one licence application within the timeframe of the IA.	The estimated cost to tidal energy developers of the rMCZ is expected to fall within the following range of scenarios: *£m/yr* | Scenario 1 | Scenario 2 Cost | 0.001 | 0.001 ***Scenario 1:*** one licence application for the tidal energy installations would be required to consider the potential effects of the construction and operational activities on the features protected by the rMCZ and the potential to achieve the MCZ conservation objectives. This is expected to result in one-off costs of £0.016m in 2015 (based on, per broad-scale habitat assessed, 6 days of a consultant's time at £700/day + 1 day for legal review at £800/day) with a present value cost of £0.015m. ***Scenario 2:*** the costs would be the same as for Scenario 1 plus the additional costs of the requirement to use removable frond matressing for cable protection. As the proposed cable routes are unknown, it is not known whether routes for any inter-array or export cables will pass through the rMCZ, and what length of cable protection may be required. If mitigation involves re-routing of proposed cable routes to avoid sensitive features, it is assumed that this will cost £1.01m/km of cable (average of estimates provided by 4 developers). If frond mattressing is used to mitigate impacts, this is estimated to cost £1m/km more than the cable protection that would have been used in the absence of the MCZ (based on a frond mat of 3

Table 2e. Renewable energy – tidal energy	**rMCZ 20, The Needles**
	metres x 3 metres; average cost provided by 2 developers). ***Additional concerns raised by stakeholders:*** SOEC considers that substantial costs for additional baseline, as well as on-going, monitoring will arise as a result of designation of this rMCZ (Merry, S., -feedback response to first tranche of IA material, 13 January 2012). It is estimated that the additional monitoring costs could be up to 20% of total project costs (which are £33.5m), or approximately £10.05m/yr. As the Centre is conceived as a test and demonstration facility for numerous tidal energy devices, it has been suggested that any additional costs may need to apply to each device that is deployed (Fawcett. J, tidal energy lead for the Isle of Wight Council, email, 7 March 2012.). The industry has not been able to provide further details of estimated costs of impact (which it anticipates may arise in avoiding impacts on sensitive features, for cable protection, repowering and recommissioning). Tidal energy is still a very new industry and there are many unknown contributing factors which accounts largely for the lack of information (Fawcett. J, tidal energy lead for the Isle of Wight Council, email, 7 March 2012.).

Table 2f: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 20, The Needles**
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 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)

Table 3. Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 20 The Needles**
Flood and coastal erosion risk management (coastal defence) 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).

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 4a. Fish and shellfish for human consumption		**rMCZ 20, The Needles**
Baseline	**Beneficial impact**	
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. Seagrass beds, which occur within the rMCZ, generally provide important nursery areas for flatfish (Joint Nature Conservation Committee, 2011) and shellfish (Natural England website,) and so are likely to help support on-site and off-site fisheries. Subtidal mixed sediments, the other principal habitat in the rMCZ, provide an important nursery area for many species, including for juvenile commercial species such as flatfishes and bass. Infralittoral and circalittoral rock are important locations for commercial inshore fishing activity, particularly for crab and lobster (Fletcher and others, 2011).	If the conservation objectives of the features are achieved, subtidal mixed sediments will be maintained in favourable condition and seagrass will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. 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	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ 20, The Needles**
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). The main fishing activities are cuttlefish trapping (effort in this area is increasing because cuttlefish is a non-quota species), potting for lobster, crab and whelk, gill netting for bass and mullet, long lining for bass and mullet, and tangle/trammel netting for sole and plaice. A description of on-site fishing activity and the value derived from it is set out in Table 2b. It has not been possible to estimate the value of the off-site benefits which derives from the seagrass nursery area.	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. The recovery of the seagrass beds to favourable condition may improve their functioning as a nursery area, potentially benefiting fisheries exploited within and outside the rMCZ. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.	

Table 4b. Recreation		**rMCZ 20, The Needles**
Baseline	**Beneficial impact**	
Angling: 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. The subtidal mixed sediments and seagrass beds within the rMCZ support high biodiversity 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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details). The rMCZ is a popular area for both shore and boat angling. An estimated 132 local private angling boats use the rMCZ (Isle of Wight	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. The recovery of the seagrass beds to favourable condition may improve their functioning as a nursery area, potentially benefiting angling activities within and outside the rMCZ (see Table 4a). 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	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation		**rMCZ 20, The Needles**
Angling Boat Survey, T Williams, 2011), excluding boats from the mainland. An estimated 1310 angling trips are made each year within this rMCZ (Shore Angling Intensity Report, T Williams, December 2010) with the most intense activity occurring during the summer months. Charter boats out of Yarmouth, Lymington and Southampton, and from west of the project area also bring anglers to the site. Due to the complex habitats in the rMCZ, it is likely to provide suitable habitat for many commercial fish species which are also important for recreational fishing and thus may help support potential on-site and off-site fisheries. Common smelt, bass, smooth hound, sole, pout and mullet, as well as crustaceans (e.g. lobster) and molluscs (e.g. whelk) occur within this site and are fished commercially and recreationally (Balanced Seas Isle of Wight Sites Meeting Report, February 2011). Solent angling representatives suggested using national statistics for the average annual household expenditure of sea anglers (£295 per year) from the Drew Report (2004) to estimate the value of the site to this sector. Assuming that one private boat equals one household, private boat anglers spend an estimated £38,940 per year within this rMCZ. Using the national average number of trips made by shore anglers per year (13.62; Drew Ltd 2004), it can be estimated that 96 shore anglers use this rMCZ. Assuming that each shore angler equates to one household, shore anglers spends an estimated £28,320 per year within this rMCZ. 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 estuary spawning and nursery area.	and off-site 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.	
Diving: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services.	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 stalked jellyfish increase, this could lead to an	Anticipated direction of change: ⇧

Table 4b. Recreation		**rMCZ 20, The Needles**
The rMCZ is used for diving and is popular both for wreck dives, such as the HMS *Pomone* found in The Needles Passage, and for its abundant marine life (www.isleofwighttouristguide.com). It has not been possible to estimate the value derived from diving in the rMCZ.	improved quality of experience for divers. The designation may lead to an increase in diving 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 diving trips at the national scale.	Confidence: Low
Wildlife watching: 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). The seagrass beds provide a safe haven for juvenile fish and other species such as sea horse, sea anemone and sessile jellyfish (Natural England website,). These are likely to contribute to an area of high biodiversity which in turn may support foraging areas for sea birds. The rMCZ is a popular area for wildlife watching, particularly bird watching and rockpooling. Alum Bay is a particularly popular spot for birdwatching (www.Fatbirder.com). The abundant fish populations support a number of foraging sea birds such as black-headed gull and great cormorant. It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. The recovery of the seagrass beds (which occur over a large part of the chalk ledges) to favourable condition may improve their functioning as a safe haven for sessile and low mobility species. Any associated increase in abundance and diversity of species that are visible to wildlife watchers may improve the quality of wildlife watching at the site and therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences. 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.	Anticipated direction of change: ⇧ Confidence: Low
Other recreation: 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 whole rMCZ is an extremely popular tourist destination, especially for recreational sailing, kite surfing, boat trips (www.theneedles.co.uk)	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. If the rMCZ is designated this will provide an additional positive	Anticipated direction of change: ⇧ Confidence:

Table 4b. Recreation		**rMCZ 20, The Needles**
and coastal walking, with numerous harbours, marinas, shopping facilities, camping sites and coastal paths available (www.iowbreaks.com/activities/watersports.php). Alum Bay is a first stop shelter for recreational vessels crossing the Channel. The Needles Park, adjacent to the rMCZ, attracts nearly half a million visitors every year giving access to the Island's most famous landmarks, The Needles Rocks and Lighthouse, as well as Alum Bay (www.dayoutwiththekids.co.uk). It has not been possible to estimate the value derived from recreation and tourism services in the rMCZ.	aspect about the location that could be promoted by the tourism and leisure industry and that would be expected to increase visitation rates. 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.	Low

Table 4c. Research and education		**rMCZ 20, The Needles**
Baseline	**Beneficial impact**	
Research: 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. Hampshire and Isle of Wight Wildlife Trust undertakes sea-floor and sea-shore surveys through Seasearch and Shoresearch (www.hwt.org.uk/events.php). The Standing Conference on Problems Associated with the Coastline (SCOPAC) also carries out research within this site, across the region between Lyme Regis and Shoreham (SCOPAC website). It has not been possible to estimate the value derived from research activities associated with the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. Hampshire and Isle of Wight Wildlife Trust provides practical and	MCZ designation may provide an opportunity to expand the focus of education events into the marine environment. Designation may aid the development of additional local (to the rMCZ) education activities (e.g. events, interpretation boards),	Anticipated direction of change: ⇧

theoretical learning opportunities as either taught lessons at its centres or as outreach in schools (from pre-school to young adults) (Hampshire and Isle of Wight Wildlife Trust website). It has not been possible to estimate the value derived from education activities associated with the rMCZ.	from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Confidence: Moderate

Table 4d. Regulating services		**rMCZ 20, The Needles**
Baseline		**Beneficial impact**
Regulation of pollution: The features of the site contribute to the bioremediation of waste (subtidal sediments and seagrass beds) water purification (subtidal sediments and seagrass beds) and sequestration of carbon (subtidal sediments and seagrass beds) (Fletcher and others, 2011). ***Environmental resilience:*** The features (subtidal sediments) of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** The features of the site, (subtidal sediments and seagrass beds) contribute to local flood and storm protection (Fletcher and others, 2011). It has not been possible to estimate the value derived from regulating services associated with the pMCZ.	If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (seagrass beds) recovered to favourable condition. Recovery of the seagrass beds 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. 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.	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ 20, The Needles**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them.	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	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ 20, The Needles**
It has not been possible to estimate the value derived from non-use and option value services associated with the pMCZ.	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. Examples of these values are shown in (Ranger, Lowe, Sanghera, & 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 'outstanding underwater features.' Furthermore, allowing species recovery was perceived as an important management reason to protect the site for the benefit of the environment but also both recreational and commercial users. In particular, MCS nominated The Needles itself, where strong personal attachment was expressed and importance to the wider community with the perception that this is 'an unspoiled oasis in our cluttered south east'. Its importance to national heritage as an 'area is spectacularly beautiful and not only has important habitats, there are also important palaeo-archaeological and palaeo-environmental deposits in the area' was highlighted by many. Source: Ranger and others (2011)	

rMCZ 20 Reference Area 20 Stalked Jellyfish (within Alum Bay) Site area (km^2): 0

Table 1. Conservation impacts			**rMCZ 20, Reference Area 20 Stalked Jellyfish (within Alum Bay)**	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) Reference Area lies within rMCZ 20 (The Needles), but its boundaries have not been determined. The site contains the only record of the stalked jellyfish *Lucernariopsis campanulata* in the Balanced Seas Project Area, which lies to the north of the Needles, and for this reason the Balanced Seas Regional Stakeholder Group has recommended that an rMCZ Reference Area be considered for this locality. However, since there is some uncertainty about the validity of the record, the RSG considered that further survey work is needed before appropriate site boundaries can be developed. This species is known to attach to algae and seagrass on the lower shore and sublittoral rocky zones but there are no more recent data than this record of 1999. This site falls within the South Wight Maritime Special Area of Conservation. 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**
Species of Conservation Importance				
Stalked Jellyfish *Lucernariopsis campanulata*		1 record	Unfavourable condition	Recover to favourable condition

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

No site boundary has yet been defined for this rMCZ Reference Area due to the uncertainty of the location of the stalked jellyfish *Lucernariopsis campanulata* and the high quantity of commercial potting and recreational activities that occur within the area. . Activities that take place in the site and that would be impacted by an rMCZ Reference Area include commercial potting, costs for future licence applications for oil and gas exploration and production, recreational anchoring, recreational sea angling and use of charter boats for angling. A further review of this site will be required when a boundary has been agreed upon.

Anticipated benefits to ecosystem services

These will be assessed for this recommended Marine Conservation Zone (rMCZ) Reference Area once the boundaries have been determined.

rMCZ 21 Wight-Barfleur Extension

Site area (km^2): 94.04

Table 1. Conservation impacts				rMCZ 21, Wight-Barfleur Extension
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) would protect some sea bed habitats, including subtidal mixed and coarse sediments that lie to the south-east of the high-energy circalittoral rock reef which is proposed for protection under the Wight-Barfleur candidate Special Area of Conservation (cSAC). The site is thought to encompass nursery and spawning grounds for mackerel and sole. Overall, the site has high benthic biotope distinctness and benthic species richness, which supports foraging grounds for various bird species and is particularly important for great cormorant and Sandwich tern. The site overlaps with part of the English Channel outburst flood feature which runs along the Solent Palaeovalley. This geomorphological feature is evidence of a megaflood which occurred some 200,000 years ago when a huge glacial lake in the North Sea burst through the Dover Straits Isthmus which contained it, thus separating England from mainland Europe. Sonar evidence of the sea bed reveals deeply gouged channels where the floodwaters broke through. This site shares a boundary with the Wight-Barfleur cSAC. 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**
Broad-scale habitats				
A5.4 Subtidal mixed sediments	70.13	-	Favourable condition	Maintain at favourable condition
A5.1 Subtidal coarse sediments	22.24		Favourable condition	Maintain at favourable condition
Habitats of conservation importance				
Subtidal sands and gravels	91.76		Favourable condition	Maintain at favourable condition

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

Table 2a. National defence	rMCZ 21, Wight-Barfleur Extension
Source of costs of the recommended Marine Conservation Zone (rMCZ)	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	

Baseline description of activity	Costs of impact of rMCZ on the sector
MOD is known to make use of the site. Activities include: anti-aircraft firing, machine gun firing, surface target towing, surface-to-surface firing, aerial towed target, acoustic trials, flares and smoke.	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).

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) (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 21 Wight-Barfleur Extension
Commercial fisheries (bottom trawls, dredges, hooks and lines, mid-water trawls, nets, pots and traps) Recreation Shipping	

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 4a. Fish and shellfish for human consumption		rMCZ 21, Wight-Barfleur Extension
Baseline	**Beneficial impact**	
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. Subtidal coarse and mixed sediments, subtidal sands and gravels are important nursery areas for many species and are potentially important spawning and nursery grounds for juvenile commercial species such as flatfishes and bass (Fletcher and others, 2011). The area of circalittoral rock is an important location for commercial inshore fishing activity, particularly for crab and lobster (Fletcher and others, 2011).	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. However, maintaining and monitoring the current fishing practices will safeguard the population of commercial fish and ensure no increase in fishing activity occurs or alternative gears are used. 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	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4a. Fish and shellfish for human consumption		**rMCZ 21, Wight-Barfleur Extension**
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). UK vessels use pots and lines in the rMCZ but trawling intensity is low (MCZ Fisheries Model). However, the site is important for French, Belgian and Dutch fishing vessels which target scallop, cuttlefish, bass, pout (bib), ray, whiting, squid and mackerel. The total value of landings derived from commercial fisheries within this site is £0.046m/yr (MCZ Fisheries Model).	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 .	

Table 4b. Recreation		**rMCZ 21, Wight-Barfleur Extension**
Baseline	**Beneficial impact**	
Angling: 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. Subtidal mixed sediment and subtidal coarse sediments support high biodiversity within the site and provide spawning and nursery grounds for many juvenile commercial fish species, and are therefore important habitats for fish and shellfish fisheries (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). The rMCZ is too far offshore for private angling boats, but is used for fishing by charter vessels from Yarmouth, Keyhaven and	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in on-site feature condition or fishing mortality is anticipated and therefore no impact on on-site benefits is expected (see Table 4a). 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. 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. The adjacent popular angling spot, the Varne Bank may benefit from possible spill-over effects.	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4b. Recreation		**rMCZ 21, Wight-Barfleur Extension**
Lymington on their way over to fish in French waters and French charter vessels fishing in UK waters. The potential spawning ground for flatfishes and generally high biodiversity, due to the complex habitats within the site, are likely to help support potential on-site and off-site fisheries. 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 potential spawning and nursery area.		
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. Subtidal mixed and coarse sediment habitats (the two dominant habitats in the rMCZ) support internationally important fish and shellfish fisheries (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). Due to its offshore location, the rMCZ has not been identified as a popular area for wildlife watching. However, the site has particularly high biodiversity and abundant fish populations, which support a number of foraging sea birds and potentially marine mammals. The site occurs within an area of the English Channel used by ferries, which often carry wildlife watchers, particularly those interested in marine mammals. Visitors in transit across the Channel may benefit from any increased biodiversity through more regular sightings of birds and marine mammals. It has not been possible to estimate the value derived from wildlife	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. 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.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ 21, Wight-Barfleur Extension**
watching in the rMCZ.		
Other recreation: Other forms of recreation are not known to take place in the rMCZ.	N/A	N/A

Table 4c. Research and education		**rMCZ 21, Wight-Barfleur Extension**
Baseline	**Beneficial impact**	
Research: 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. No known formal research activities are currently carried out in the rMCZ. However, ferries crossing the English Channel are often utilised by marine mammal observers whose data contribute to national databases. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity occurs in the rMCZ.	As the rMCZ is approximately 44km 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 external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ 21, Wight-Barfleur Extension**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste (subtidal sediments) water purification (subtidal sediments) and sequestration of carbon (subtidal sediments) (Fletcher and others, 2011).	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human	Anticipated direction of change: ⇔

Environmental resilience: The features (subtidal sediments) of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** As the site is offshore, its features are not thought to contribute to the delivery of this service (Fletcher and others, 2011). It has not been possible to estimate the value derived from regulating services associated with the pMCZ.	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.	Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ 21, Wight-Barfleur Extension**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the pMCZ.	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.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ 21 Reference Area 14 Wight-Barfleur — Site area (km^2): 24.58

Table 1. Conservation impacts			**rMCZ 21, Reference Area 14 Wight-Barfleur**	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) Reference Area has been identified primarily for one broad-scale habitat (subtidal coarse sediment) and lies across the southern boundary of the Wight-Barfleur proposed Special Area of Conservation (pSAC) and the northern boundary of rMCZ 21 (Wight-Barfleur Extension). The rMCZ Reference Area includes the edge of the Wight-Barfleur reef, which has been surveyed recently in the preparation of the pSAC proposal. The wider rMCZ is thought to encompass nursery and spawning grounds for mackerel and sole and has a high benthic biotope distinctness and benthic species richness supporting foraging grounds for various bird species. It is particularly important for great cormorants and Sandwich terns, to which the rMCZ Reference Area may contribute. 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**
Broad-scale habitats				
A4.1 High energy circalittoral rock	-	-	Unfavourable condition	Recover to favourable condition
A5.1 Subtidal coarse sediment	16.6	-	Unfavourable condition	Recover to favourable condition
A5.4 Subtidal mixed sediments	-	-	Unfavourable condition	Recover to favourable condition
Habitats of Conservation Importance				
Subtidal sands and gravels	24.58	-	Unfavourable condition	Recover to favourable condition

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

Table 2a. Commercial fisheries	**rMCZ 21, Reference Area 14 Wight-Barfleur**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Closure of entire site to all gear types.	
Summary of all fisheries The rMCZ Reference Area is beyond the 12nm (nautical mile) limit and lies across the southern boundary of the Wight Barfleur pSAC and the northern boundary of rMCZ 21 Wight-Barfleur Extension. UK vessels deploy pots and undertake a small amount of trawling in the rMCZ Reference Area (MCZ Fisheries Model). The site is important for French, Belgian and Dutch fishing vessels. More detail on the approach used for the fisheries method is provided in Annexes H7 and N4. It is unknown how many UK vessels use this rMCZ.	

<table>
<tr><th colspan="2">Table 2a. Commercial fisheries rMCZ 21, Reference Area 14 Wight-Barfleur</th></tr>
<tr><td colspan="2">Estimated value of UK pot and trap landings from the rMCZ Reference Area: £0.007m/yr.</td></tr>
<tr><th>Baseline description of UK commercial fisheries</th><th>Costs of impact of rMCZ on UK commercial fisheries</th></tr>
<tr><td>Pots and traps: One stakeholder (who works as part of the Selsey Fishermen's Association and targets lobster) indicated that the rMCZ Reference Area overlaps with their area of operation (FisherMap Data 2010).
Estimated total value of landings from the rMCZ Reference Area: £0.007m/yr (MCZ Fisheries Model).</td><td>Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.007</td></tr></table></td></tr>
<tr><th>Total direct impact on UK commercial fisheries</th><th></th></tr>
<tr><td></td><td>The estimated annual value of UK landings and gross value added (GVA) affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.007</td></tr><tr><td>GVA affected</td><td>0.003</td></tr></table></td></tr>
<tr><th>Baseline description of non-UK fisheries</th><th>Costs of impact of rMCZ on non-UK commercial fisheries</th></tr>
<tr><td>The French, Belgian and Dutch fleets are active in the site.
Some French vessels use this rMCZ Reference Area intensively (Balanced Seas Final Recommendations Report, 2011; Viera, A. from CRPMEM., feedback response to 1st tranche of material, 13 January 2012):
Haute Normandie fleet: 13 trawlers, scallopers and pelagic trawlers target scallop, cuttlefish, bass, pout (bib), ray, whiting, squid and mackerel in the site.
Basse Normandie fleet: a large number of trawlers take a range of species from the site.
More detailed estimates are not available for this site. This rMCZ Reference Area overlaps with rMCZ 21 Wight-Barfleur and is about 20% of the size.
Estimated total value of landings from by French vessels) from the rMCZ Reference Area 14 is £0.21m/yr based on 20% of the values for rMCZ 21.</td><td>French, Belgian and Dutch vessels that fish in the site using all gear types would be affected by closure of this rMCZ Reference Area. A rough estimate of the value of French landings affected is £0.21m/yr. Estimates are not available for other countries.</td></tr>
</table>

Table 2b. National defence	**rMCZ 21, Reference Area 14 Wight-Barfleur**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the site. The entire rMCZ Reference Area is covered by national defence – the air, water column and sea bed. The main impacts on the rMCZ Reference Area are listed as: air and water surface – noise and physical and visual disturbance; water column noise; and sea bed – fixed equipment.	It is not known whether this rMCZ Reference Area 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 2c. Recreational anchoring	**rMCZ 21, Reference Area 14 Wight-Barfleur**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Closure of entire site to all recreational anchoring (except in emergency circumstances).	
Baseline description of activity	**Costs of impact of rMCZ on sector**
Twenty-five StakMap stakeholder interviews indicated that yachting interests overlap with the rMCZ Reference Area. However, in all cases the rMCZ Reference Area represents a small proportion of the overall area used for yachting and no interviewees indicated that they anchor there. Anchoring of diving and recreational sea angling vessels and charter boats within this rMCZ Reference Area was also not reported during any relevant Local Group discussions throughout the site recommendation process. However, a stakeholder indicated that charter boat operators from Langstone Harbour and Lymington say that they and French charter boats anchor when the tide and weather allow when they are fishing in this area (S. Wall-Palmer, Langstone Harbour charter boat operator, pers. comms., February, 2011).	The management for the rMCZ Reference Area is unlikely to impact on the recreational sailing sector but will impact on the recreational angling and charter boats that currently anchor in the site. The costs of the impact of the site on recreational sea angling and charter vessels are assessed in Table 2d below.

Table 2d. Recreation – recreational angling **rMCZ, 21 Reference Area 14 Wight-Barfleur**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

Closure of the entire site to all recreational angling.

Baseline description of activity	Costs of impact of rMCZ on the sector
Most charter angling boats do not operate out this far offshore but a small number of Solent-based boats use the site. Six StakMap interviewees (one representative of a club that uses charter boats and five charter boat operators) indicated that there is a small overlap between the rMCZ Reference Area and their areas of operation. The site is used by at least two vessels from Langstone Harbour and some French charter vessels, which may anchor to fish in the site when tide and weather allow (S. Wall-Palmer, Langstone Harbour charter boat operator, pers. comms., December 2011). The area overlaps with some of the most popular wreck fishing sites in the locality, and accounts for 80% of wreck angling by Solent-based vessels (S. Wall-Palmer, Langstone Harbour charter boat operator, ,pers. comms., December 2011) . Vessels often stop in the site on the way to French waters on two-day trips, targeting conger eel and black bream (in February/March) with drift fishing (S. Wall- Palmer, Langstone Harbour charter boat operator, pers. comms., December 2011). Vessels based at Lymington and Keyhaven occasionally use this site (A. Savage, Solent/IOW/Hants Lcoal Group charter boat representative, pers. comms., January 2012). Two charter boat operators estimate that they make on average of 40 two-day trips per year to this site each, with revenue of £1,000 per trip (S. Wall-Palmer, Langstone Harbour charter boat operator ,pers. comms.,December 2011).	Closure of the site to angling is expected to result in significant costs for a small number of Solent-based charter vessels. The vessels are unable to fish alternative grounds in the area because of the nature of the fishing marks and the depth of the water around the site (which is too shallow on one side and too deep on the other) (S. Wall-Palmer, Langstone Harbour charter boat operator, pers. comms., December 2011). It is anticipated that the charter boats based at Lymington and Keyhaven that occasionally use the site would not be likely to affected by its closure (A. Savage, Solent/IOW/Hants Lcoal Group charter boat representative, pers. comms., January 2012). The costs are estimated in terms of loss of revenue for two charter boat businesses (only two operators provided data for the Impact Assessment). It is assumed that the operators lose all of their revenue from the trips that they make to the site and that they cannot respond to the closure by fishing at alternative sites (for the reasons given above). The total loss of revenue for the two operators is £0.080m/yr (based on an average of 40 two-day trips per year to the site each, with revenue of £1,000 per trip). This may represent 40% of the total annual turnover of these businesses (S. Wall-Palmer, Langstone Harbour charter boat operator, pers. comms., December 2011). Potential lost revenue for other UK-based vessels and for French charter vessels is not known. The values provided below are therefore likely to be under-estimates. *£m/yr* — Scenario 1 Estimated value of charter boat revenue affected — 0.080 GVA affected — 0.038

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) (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 21, Reference Area Wight-Barfleur**
Recreation (except for the activities listed above in table 2) Shipping	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ 21, Reference Area 14 Wight-Barfleur**	
Baseline	**Beneficial impact**	
Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption. Subtidal coarse sediments are important nursery areas for many species and are potentially important spawning and nursery grounds for juvenile commercial species such as flatfish and bass (Fletcher and others, 2011). Circalittoral rock is an important location for commercial inshore fishing activity, particularly crab and lobster (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 rMCZ 21 Table 1 for details). This is an important fishing area for both UK and non-UK vessels. A description of on-site fishing activity in the rMCZ Reference Area, which involves a number of gear types, and the value derived from it, is set out	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ Reference Area. The costs of this are set out in Table 2a. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Closure of the rMCZ Reference Area to fishing activity will reduce the on-site fishing mortality of species which could, given the relatively large size of this site, benefit stocks of mobile commercial finfish species.	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption	**rMCZ 21, Reference Area 14 Wight-Barfleur**	
in Table 2a. It has not been possible to estimate the value of the off-site benefits that derive from the spawning and nursery area.	As no fishing will be permitted within the rMCZ Reference Area, no on-site benefits will be realised.	

Table 4b. Recreation	**rMCZ 21, Reference Area 14 Wight-Barfleur**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption and recreation services. Subtidal coarse sediments support high biodiversity within the site and provide spawning and nursery grounds for many fish species, and are thus important habitats for recreational fisheries (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 rMCZ 21 Table 1 for details). Charter boat angling is an important activity in this rMCZ Reference Area and a description of this activity is set out in Table 2d. 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.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to closure of the rMCZ Reference Area (see Table 4a). As angling will not be permitted within the rMCZ Reference Area, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers outside the rMCZ Reference Area. Such benefits may be insignificant.	Anticipated direction of change: ⇧ Confidence: Low
Diving: Diving is not known to take place in the site	N/A	N/A
Wildlife watching: Wildlife watching is not known to take place in the site.	N/A	N/A
Other recreation: No other recreational activities are known to take place in this site.	N/A	N/A

Table 4c. Research and education	**rMCZ 21, Reference Area 14 Wight-Barfleur**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. No known research activity takes place in the site.	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of education services. No known education activity takes place in the site.	As the rMCZ Reference Area is approximately 44km offshore and thus inaccessible, no benefits are likely to arise from direct use of the site for education. Non-visitors may benefit if the rMCZ Reference Area contributes to external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services	**rMCZ 21, Reference Area 14 Wight-Barfleur**	
Baseline	**Beneficial impact**	
Regulation of pollution: Subtidal sediments contribute to the bioremediation of waste, water purification and sequestration of carbon (Fletcher and others, 2011). ***Environmental resilience:*** Subtidal sediments contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** As the site is offshore, its features do not contribute to the delivery of this service.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of subtidal sediments and closure to fishing could increase the site's benthic biodiversity and biomass, improving the regulating capacity of its habitats. Designating the recommended Marine Conservation Zone (rMCZ) Reference Area 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,	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ 21, Reference Area 14 Wight-Barfleur**
It has not been possible to estimate the value derived from regulating services associated with the rMCZ Reference Area.	mitigation would be introduced, with the associated costs and benefits).	

Table 4e. Non-use and option values		**rMCZ 21, Reference Area 14 Wight-Barfleur**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) Reference Area and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of its 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 Reference Area 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.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ 22 Bembridge

Site area (km^2): 94.04

Table 1. Conservation impacts **rMCZ 22, Bembridge**

1a. Ecological description

The site lies adjacent to the east coast of the Isle of Wight and would protect a diverse range of species and habitats with several species reaching the eastern limit of their distribution within the English Channel, such as the peacock's tail, found on the ledges to the south of Bembridge Harbour; these populations are considered to seed other populations around the Isle of Wight. The lagoon sand shrimp and starlet sea anemone occur in Bembridge Harbour and adjacent areas above the mean high water mark. Two species of seahorse occur in the recommended Marine Conservation Zone (rMCZ) which provides suitable breeding habitat for both species. The only location of maerl beds in the Balanced Seas Project Area lies off Culver Spit. One of only two occurrences of the kaleidoscope jellyfish in the Project Area is in this site, as well as two regionally extremely scarce habitat features of conservation interest – mud habitats in deep water, and sea-pens and burrowing megafauna – which occur at the same spot in the north of the rMCZ. The northern part of the site has particularly high biodiversity in the form of benthic biotope richness and benthic species taxonomic distinctness. Extensive areas of limestone and chalk bedrock provide a complex system of crevices, tunnels and pools supporting a very diverse algae and invertebrate fauna. Most notably the site contains littoral chalk, exposed at low tide, and subtidal chalk in the north of the site along the area known as Tyne and Bembridge Ledges, which has the only record in the Balanced Seas Project Area of the rare sea snail *Paludinella littorina*.

A diverse array of demersal and pelagic fish and shellfish are supported by the high biodiversity (e.g. black sea bream, plaice, lobster and squid). Migratory fish use the area (e.g. Atlantic salmon, European eel and the rare twaite shad). In addition the area is important for a number of foraging birds and offshore waterfowl such as great crested grebe. The area is the best foraging area for Sandwich tern in the Balanced Seas project area. This site partially overlaps the South Wight Maritime Special Area of Conservation (SAC), Whitecliff Bay and Bembridge Ledges Site of Special Scientific Interest (SSSI), Brading Marshes to St Helen's Ledges SSSI and Solent and Isle of Wight Lagoons SAC.

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
REC Broad-scale Habitats				
A5.2 subtidal sand	12.35		Favourable condition	Maintain at favourable condition
A5.3 subtidal mud	1.36		Unfavourable condition	Recover to favourable condition
A5.4 subtidal mixed sediments	61.31		Favourable condition	Maintain at favourable condition
Habitats of Conservation Importance				
Common maerl		1 record	Unfavourable condition	Recover to favourable condition
Mud habitats in deep water		1 record	Unfavourable condition	Recover to favourable condition
Native oyster beds	-	-	Unfavourable condition	Recover to favourable condition (as

Table 1. Conservation impacts				**rMCZ 22, Bembridge**
Rossworm (*Sabellaria spinulosa)* reef	625.33 m^2		Unfavourable condition	Recover to favourable condition
Seagrass beds	0.24		Unfavourable condition	Recover to favourable condition
Seapens and burrowing megafauna		1 record	Unfavourable condition	Recover to favourable condition
Species of conservation importance				
Tentacled Lagoon Worm (*Alkmaria romijni*)		4 records	Favourable condition	Maintain at favourable condition
Lagoon Sand Shrimp (*Gammarus insensibilis*)†	-	-	Favourable condition	Maintain at favourable condition
Kaleidoscope Stalked Jellyfish (*Haliclystus auricula*)		1 record	Favourable condition	Maintain at favourable condition
Long-snouted seahorse (*Hippocampus guttulatus*)		1 record	Favourable condition	Maintain at favourable condition
Short-snouted seahorse (*Hippocampus hippocampus*)		4 records	Favourable condition	Maintain at favourable condition
Starlet Sea Anemone (*Nematostella vectensis*)	-	-	Favourable condition	Maintain at favourable condition
Native Oyster (*Ostrea edulis*)		11 records	Unfavourable condition	Recover to favourable condition
Peacock's Tail (*Padina pavonica*)		78 records	Favourable condition	Maintain at favourable condition
Sea Snail (*Paludinella littorina*)	-	-	Favourable condition	Maintain at favourable condition

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

Table 2a. Aggregate Extraction **rMCZ 22, Bembridge**

Source of costs of the rMCZ

***Management Scenario 1*:** Increase in costs of assessing environmental impacts for future licence applications for existing production licences and current licence applications within 1km of an rMCZ. Also additional costs for provision of information that will be used for these assessments, which will be incurred for the entire suite of sites. This provides the best estimate of impact.

Management Scenario 2: 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.

Baseline description of activity	**Costs of effect of MCZ on the sector**
There is 1 licensed aggregate extraction production area (No. 122/3) within 1km of the rMCZ. It is anticipated that the Environmental Impact Assessment for renewal of this licence will be conducted in 2026 (based on information provided by The Crown Estate (pers. comm., 2012).	

Average annual site-specific costs £m/yr	Scenario 1	Scenario 2
Cost to the operator	0.001	Assessed for the suite of sites

	Scenario 1 : 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 the British Marine Aggregate Producers Association (BMAPA) (pers. comm.., 2011). An additional cost will also be incurred in provision of information by BMAPA 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. **Scenario 2:** An assessment of the additional costs of 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.

Table 2b. Archaeological heritage	**rMCZ 22, Bembridge**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in the 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 also be placed on anchoring in areas of vulnerable rMCZ features in the site, including seagrass and Ross worm *Sabellaria spinulosa* reef.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Several World War II defence aids/structures are recorded in the site, including pillboxes and anti-aircraft emplacements. Vessel wrecks of British, French, Swedish, Dutch, American, Irish and German origin are recorded within the site, as well as a World War II German Messerschmitt aircraft wreck. Several other unidentified obstructions have been reported by fishers. Artefacts of Palaeolithic, Romano-Celtic and Neolithic age have been found within the site. Crop marks	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 for one licence application could be in the region of £500–£10,000, depending on the size of the rMCZ (English Heritage, pers. comm., 2012). No further impacts on activities related to archaeology are anticipated.

Table 2b. Archaeological heritage	**rMCZ 22, Bembridge**
and cup and ring marks are also recorded. There is one designated monument within the site, that of St Helens Fort (English Heritage,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).	If archaeologists respond to restrictions on anchoring over areas of seagrass or Ross worm *Sabellaria spinulosa* 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 these restrictions, this will prevent interpretation of archaeological evidence from the site, thereby decreasing the acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

Table 2c. Commercial fisheries	**rMCZ 22, Bembridge**
Source of costs of the Recommended Marine Conservation Zone (rMCZ) The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. Therefore, two management 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. ***Management scenario 1:*** Closure of the entire rMCZ to bottom trawls and dredges to protect areas of Ross worm *Sabellaria spinulosa* reef and seagrass beds (Statutory Nature Conservation Bodies (SNCB) informed scenario). ***Management scenario 2:*** Closure of the entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps to protect all features of concern (SNCB informed scenario).	
Summary of all fisheries: 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 in Bembridge, Ventnor , Portsmouth, Lymington and Selsey, and several beach-based static gear boats are based at Steephill Cove and Bonchurch (IA questionnaire response from Isle of Wight vessel owners, August 2011). The most important fishery is potting, with crab/lobster and prawn fisheries both important to the local economy. Some of the shellfish is used nationally and some is exported to France and Spain. Other fisheries that take place in the rMCZ include set nets, longlines, traps, trawls and towed dredges. Much of the ground is unsuitable for towed gears. The Southern Inshore Fisheries and Conservation Authority (IFCA) estimates that a maximum of 4 under 15 metre vessels operate in the site at any one time (Southern IFCA, feedback response to first tranche of IA material, 16 January 2012). Certain commercial fishing restrictions are already in existence (listed in Annex E1). An IFCA byelaw prohibits fishing by vessels over 12 metres within 6nm over an area that covers the site (Southern IFCA, feedback response to first tranche of IA material, 16 January 2012). The Southern IFCA is currently developing a Seagrass Management Strategy which will include a voluntary code of conduct that closes areas of sea grass to bottom trawls and dredges around the Isle of Wight (from mean high water out to a distance that is currently being determined) (Jury, J.,	

<table>
<tr><th colspan="2">Table 2c. Commercial fisheries rMCZ 22, Bembridge</th></tr>
<tr><td colspan="2">Southern IFCA email, 24 April 2012; The SIFCA and the Seagrass Working Group (SWG). 2012). This will deliver part of the management that would be required under Scenarios 1 and 2. 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: £0.264 million per year (m/yr) (this is likely to be an overestimate due to the future implementation of the Southern IFCA Seagrass Management Strategy to protect areas of seagrass through a voluntary code of conduct (Jury, J., Southern IFCA email, 24 April 2012)).</td></tr>
<tr><th>Baseline description of UK commercial fisheries</th><th>Costs of impact of rMCZ on UK commercial fisheries</th></tr>
<tr><td>Bottom trawls: Southern IFCA estimates that a maximum of 4 under 15 metre vessels operate in this area and that these do so infrequently (Southern IFCA, pers. comm., 2012).

Estimated total value of landings from the rMCZ: £0.017m/yr (MCZ Fisheries Model).

This is likely to be an overestimate due to the resolution of the MCZ Fisheries Model.</td><td>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>0.017</td><td>0.017</td></tr></table>The above values are likely to be overestimates due to the resolution of the MCZ Fisheries Model and the implementation of the Southern IFCA Seagrass Management Strategy to protect areas of seagrass through a voluntary code of conduct, which will significantly reduce the activity of bottom trawls in this rMCZ (Jury, J., Southern IFCA email, 24 April 2012).</td></tr>
<tr><td>Dredges: Southern IFCA estimates that 4 under 15 metre vessels operate at any one time, for a few weeks at the start of the oyster season (November), due to the decline in oysters ((Jury, J., Southern IFCA email, 24 April 2012)).

Estimated total value of landings from the rMCZ: £0.021m/yr (MCZ Fisheries Model).

This is likely to be an overestimate due to the resolution of the MCZ Fisheries Model..</td><td>The estimated annual value of UK dredge 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>0.021</td><td>0.021</td></tr></table>The above values are likely to be overestimates as the implementation of the Southern IFCA Seagrass Management Strategy to protect areas of seagrass through a voluntary code of conduct will significantly reduce the activity of dredges in this rMCZ (Jury, J., Southern IFCA emai., 24 April 2012).</td></tr>
<tr><td>Pots and traps: Estimated total value of landings from the rMCZ: £0.159m/yr (MCZ Fisheries Model).

Stakeholders indicated that Sandown Bay is a vital potting area for 6 Ventnor-based vessels. Several more beach-based vessels</td><td>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>0.159</td></tr></table></td></tr>
</table>

<table>
<tr><th colspan="2">Table 2c. Commercial fisheries rMCZ 22, Bembridge</th></tr>
<tr><td>(based at Steephill Cove and Bonchurch) deploy pots in the site during the winter and during south-westerly gales (IA questionnaire response froman Isle of Wight vessel owner, August 2011)).</td><td></td></tr>
<tr><td>Hooks and lines: Number of vessels is unknown.Estimated total value of landings from the rMCZ: £0.006m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line 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>0.006</td></tr>
</table>
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.</td></tr>
<tr><td>Nets: Number of vessels is unknown.
Estimated total value of landings from the rMCZ: £0.058m/yr (MCZ Fisheries Model).</td><td>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>0.058</td></tr>
</table></td></tr>
<tr><td colspan="2">Total direct impact</td></tr>
<tr><td></td><td>The estimated annual value of UK landings and gross value added (GVA) 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>0.038</td><td>0.261</td></tr>
<tr><td>GVA affected</td><td>0.017</td><td>0.123</td></tr>
</table>
These values are likely to be overestimates due to the future implementation of the Southern IFCA Seagrass Managment Strategy to protect areas of sea grass through a voluntary code of conduct which will close areas of sea grass to bottom trawls and dredges around the Isle of Wight. (Jury, J., Southern IFCA email, 24 April 2012).
The four fisheries representatives from the Isle of Wight who were interviewed for the IA</td></tr>
</table>

Table 2c. Commercial fisheries	**rMCZ 22, Bembridge**
	indicated that closure of the rMCZ to potting would significantly affect vessels based in Ventnor, Bembridge, Steephill Cove and Bonchurch for which the site is an important ground. In Bembridge, at least 6 full-time and 6 part-time fishers would be affected by Scenario 2, and of these at least 5 full-time potters/netters would lose their entire income. The four Isle of Wight vessel owners who were interviewed considered that it would not be feasible for any of the affected fishers to respond by fishing alternative grounds because: (i) all other fishing grounds have existing users and any increased effort within them could lead to conflict; and (ii) all available species are already fished using appropriate gears (see Annex J3afor more detail). They suggested that affected vessels would experience a significant loss of revenue which could force them to leave the fleet. This could impact on employment of the crews of 10 boats, 12 staff at Ventnor Haven Fishery and 7 wholesalers, and have an important social impact on local fishing communities through loss of revenue from national sales and exports to France and Spain. The closure would also impact indirectly on local fish markets, restaurants, fish retailers and activities linked to the fishing sector such as repairs, fuel services and gear suppliers (IA questionnaire response from Blake, G., Kennet, J. and Wareham, M., Isle of Wight vessel owners, 26 & 27 August 2011).
Baseline description of non-UK fisheries	**Costs of impact of rMCZ on non-UK commercial fisheries**
	None.

Table 2c. National defence	**rMCZ 22, Bembridge**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include rMCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the site for non-explosives mine-countermeasures training.	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 22, Bembridge**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

Management scenario 1: 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. It is anticipated that additional mitigation of impacts on features protected by the rMCZ will be needed for commercial anchoring relative to the mitigation provided in the baseline.

Management scenario 2: Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for navigational dredging and all port and harbour developments within 5 km of the rMCZ. Also, additional costs to update the existing Maintenance Dredging Protocol (MDP) for Southampton Water and for including MCZ features in a potential new MDP for Bembridge. It is anticipated that additional mitigation of impacts on features protected by the rMCZ will be needed for commercial anchoring.

Baseline description of activity	Costs of impact of rMCZ on the sector
Navigational dredge areas: There is licensed navigational dredging of the main shipping channel within 1km of this rMCZ. There is also dredging on a smaller scale associated with the port of Bembridge. 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 are covered by an existing and a potential new MDP, it is assumed that the assessment of environmental impact is not changed over the 20 year period of the IA. There is licensed navigational dredging of the main shipping channel within 5km of this rMCZ. There is also dredging on a smaller scale associated with the port of Bembridge. 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. ***Port development:*** There are two ports within 5km of the rMCZ that may undergo development in the future: Bembridge and Ventnor (Ports & Harbours UK, 2012). This may not represent a	*£m/yr* / Scenario 1 / Scenario 2 Total / 0.002 / 0.003* * 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 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. ***Scenario 1:*** 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).

Table 2d. Ports, harbours, shipping and disposal sites	rMCZ 22, Bembridge
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). ***Commercial shipping anchorage:*** The St Helen's Roads anchorage covers a large part of the northern section of the rMCZ. The western part of the anchorage fully overlaps the area of sub-tidal mud. The north-west part of the anchorage lies immediately adjacent to the data points for seapens and burrowing megafauna and for mud habitats in deep water. The anchorage has been in use for over 50 years and has developed because its sheltered location ensures the relative safety of commercial vessels bound for Southampton and Portsmouth. It is heavily used on a daily basis and is particularly used as a safe anchorage during heavy south-westerly winds by vessels entering/exiting Portsmouth and Southampton and vessels in transit from/to other UK ports or simply passing through (Hare, N. letter., 28 February 2012; Portsmouth Queen's Harbour Master (QHM), pers. Comm., November 2011). Vessels up to 7 metres in draught and 149.99 metres in length may anchor at St Helen's Roads anchorage (larger vessels must anchor at the Nab anchorage to the south-east). Up to 11 vessels anchor each day, with an average of 4 vessels. Vessels usually anchor for several days, but some anchor for only 1–2 hours and others for up to 10 days. On average there are 3.5 days a year when no ships are at anchor in the anchorage. Vessels using the area include barges, liquefied petroleum gas vessels, tankers, chemical tankers, general cargo vessels, roll-on roll-off vessels, dredgers and small container feeder carriers (Hare, N. letter, 28 February 2012; Portsmouth Queen's Harbour Master (QHM),	***Scenario 2:*** Future licence applications for navigational dredging port or harbour development plans or proposals and commercial shipping anchoring 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). Additional costs will be incurred to the existing Maintenance Dredging Protocol (MDP) for Southampton Water and to include MCZ features in a new potential MDP for Bembridge 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. ***Mitigation of impacts for commercial shipping anchoring for Scenarios 1 and 2:*** Portsmouth QHM considers that there is no alternative anchorage within or near the Solent that could cater for the current operational requirements (Portsmouth QHM, email, November 2011) and so relocation of the anchorage is not considered feasible. Reasons include the large area covered by the anchorage, its intensity of use, commercial and safety considerations and its use by international as well as UK vessels. Portsmouth QHM and Associated British Ports (ABP) have indicated that the anchorage could not be partially or completely closed for commercial and safety reasons. For the reasons given above the IA assumes that use of the anchorage would continue and the impacts on the MCZ features would not be mitigated. The cost is assessed in the impact assessment (IA) in terms of the hypothetical cost to operators providing environmental benefit that is equivalent to the impact that anchoring in the site would have on the MCZ's features. In the event that an activity impacts on achieving the conservation objectives of an MCZ's features, this would be required under Section 126(7) of the Marine and Coastal Access Act 2009. The cost is hypothetical because it would be infeasible for the the large number of operators that use the anchorage to undertake to provide equivalent environmental benefit. Alternative m management options suggested by the Regional Stakeholder Group (RSG)

Table 2d. Ports, harbours, shipping and disposal sites	**rMCZ 22, Bembridge**
pers. Comm., November 2011).	(RSG 11 meeting) and Natural England (R. Waldock, pers. comm., December 2011) are presented below. Impacts of these are not assessed in the IA because both the QHM and ABP consider that no feasible mitigation can be provided: • limiting the number of vessels using the anchorage at any one time (this would require improved berth availability to limit the need for lay-up awaiting berthing space); • limiting the size of vessels using the anchorage; • provision of a permanent anchorage system within the site (this would be dependent on vessel size). ABP, in their IA feedback form (Jan 2012) however noted that they could "agree to some level of management in conjunction with the Queen's Harbour Master should the restricted anchorage area be much reduced (i.e. to just the specific points of the most sensitive features). Such management could include remote monitoring via radar and charting the restricted points,"

Table 2e. Recreational anchoring	**rMCZ 22, Bembridge**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Creation of no-anchoring zones for recreational vessels (except in emergency circumstances) over areas of maerl bed, Ross worm *Sabellaria spinulosa* reef. Creation of no-anchoring zones over areas of seagrass bed and installation of permanent eco-moorings In appropriate locations (assuming that the mooring structures provide the necessary mitigation of impacts on the feature).	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Overview: The greatest concentration of boating activity, and thus anchoring of recreational vessels, in the rMCZ is around Bembridge and Seaview. Six sailing clubs lay a range of fixed marks, seasonally, and inflatable laid marks within the rMCZ. The marks are used frequently, especially during regattas and training events. In addition, an estimated 198 private sea-angling boats operate from Bembridge Harbour through to Ventnor and these may anchor anywhere while fishing in the site (or while waiting for tidal change in order to enter Bembridge Harbour). The baseline and impacts are presented below for each feature as the features cover geographically separate areas in the rMCZ.	
Maerl bed: The maerl bed occurs on Culver Spit, south-east of Culver. StakMap results indicate a very low level of anchoring here, with only 1 sailing club stating that it uses this location. Three sea-angling clubs and 7	***Maerl bed:*** impacts of anchoring on the maerl bed off Culver Spit would be mitigated through creation of a no-anchoring zone (except in emergency circumstances). Use of the area for anchoring is limited and the no-anchoring

Table 2e. Recreational anchoring	**rMCZ 22, Bembridge**
charter boats use this site as part of a wider area for angling, and so anchoring of vessels may occur but is not likely to be at a high intensity.	zone is not expected to significantly impact on recreational vessel users. It is anticipated that vessel users will respond by anchoring in alternative suitable areas in the vicinity.
Ross worm* Sabellaria spinulosa *reef: The known areas of *Sabellaria spinulosa* reef, which are small, occur east of Culver Spit and within the offshore area of Sandown Bay. StakMap results indicate that very little anchoring by recreational water-sports vessels overlaps this feature. Only 1 club stated that its members use the areas for anchoring as part of a wider area. The intensity of anchoring by vessels used for recreational sea angling is expected to be higher. Between 5 and 8 clubs and approximately 15 charter boats fish in the general area regularly and also anchor there (StakMap). Most vessels that fish in the area use the Natural England recommended rope risers that have less environmental impact than some anchors (Tony Williams, BS IA 1st Tranche Feedback, January 2012).	***Ross worm (*Sabellaria spinulosa*) reef:*** Since the known areas of *Sabellaria spinulosa* reef appear to be small, the creation of no-anchoring zones over these is not expected to significantly impact on vessels that anchor in the area, despite the high intensity of angling activity described in the baseline. Local recreation representatives have requested that the full extent of *Sabellaria spinulosa* reef is determined through a survey (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011). Costs of the surveys are included as part of the costs for surveying the features in the site. If the feature is found to be more widespread than currently indicated, creation of no-anchoring zones over the areas of reef could potentially impact on the recreational sea-angling sector considerably through loss of fishing grounds and possibly decrease revenues for local businesses on the Isle of Wight and in Hampshire. Mitigation of anchoring by sea-angling boats is more difficult than that by recreational sailing boats, as they do not anchor in concentrated numbers and the areas where they anchor are dependent on fishing marks.
Seagrass beds: StakMap results indicate that some anchoring by non-motorised vessels occurs over the seagrass beds, with approximately 8 clubs stating that they use the area north of Bembridge Harbour; only 1 club says it uses the area south of the harbour. Racing marks are laid out seasonally in the vicinity of seagrass beds but not overlapping them. Recreational angling from private boats and some charter boat activity takes place in the area south of the harbour along Bembridge Ledges. Twelve charter boats and clubs indicated that they regularly use this part of the site (which overlaps the seagrass beds) for fishing and therefore anchor there (StakMap). The following areas within the rMCZ are important for permanent moorings	***Seagrass beds:*** It is anticipated that creation of no-anchoring zones would need to be accompanied by replacement of existing moorings with eco-moorings and installation of further permanent eco-moorings mooring structures (if this provided the necessary mitigation of impacts on the feature), given the large number of vessels that anchor over seagrass in this area of the rMCZ.. Although displacement of anchoring into the northern half of Priory Bay, where there is no seagrass, is possible at all times of the year, on weekends of peak use this could lead to overcrowding which could possibly make the area unsafe (M. Samuelson, email, 13th January 2012). Using the approach developed and costs calculated for the installation of eco-mooring in Studland Bay (Marina Projects, 2011), costs have been calculated

Table 2e. Recreational anchoring	**rMCZ 22, Bembridge**
and anchoring. All of them overlap areas of seagrass beds according to project data (Samuelson, M. Boating Leisure Activities in BAI 22 v2.pdf, February, 2011): • Seaview: **this is an** extensive area of over 150 recreational boat moorings off Seaview Yacht Club and southwards into Seagrove Bay between Nettlestone Point and Horestone Point, as well as about15 moorings used by sea-angling boats. • Priory Bay: extensive anchoring within and up to 1,500 metres seaward of Priory Bay during the summer (peaks July to September). In 2011, a total of 567 vessels anchored in the 'southern anchorage' of the bay, which overlaps the area of seagrass bed, with a maximum of 10 vessels (both non-motorised and motorised) anchoring at any one time during the peak summer months (Mike Samuelson, RYA, email, 13th November 2011). The numbers of vessels that anchor here are much higher than for other areas of Priory Bay where there is no seagrass. • St Helen's Tide Gauge and outer entrance to Bembridge Harbour: this is heavily used for anchoring during the summer while vessels wait for the tide to be right for entry to Bembridge. • Silver Beach (beach to the south side of the entrance to Bembridge Harbour): a small number of moorings have been laid off Silver Beach/Ducie by owners of the beachfront properties. • Bembridge (Under Tyne): there are over 50 moorings in use throughout the sailing season; ground chains and risers remain throughout the year. There is regular anchoring by visiting craft seaward of the moorings during the sailing season. Speed-limit buoys are laid 1,000 metres out during the summer season. Some 60 sea-angling boats are also moored in Bembridge Harbour, when the boats are not being used for fishing. • Bembridge Lifeboat Station: the Royal National Lifeboat Institution moorings and breasting buoys are just north of the offshore lifeboat station. Six sea-angling boats are moored here as well, when not in use for fishing.	for the replacement of all the moorings listed in the baseline and for providing additional moorings to accommodate the extra anchoring described. It is estimated that installation of 300 eco-moorings would be sufficient. Capital costs for 300 eco-moorings is estimated to total £1.134m (see Annex N12 for the assumptions used in the calculations), a one-off cost assumed to occur in the first year after designation (2013). This may overestimate the costs because it allows for the removal of existing moorings and there are none in Priory Bay. Operating costs, including maintenance of the eco-moorings and collection of mooring fees, are estimated to total £0.141m/yr (see Annex N12 for the assumptions used in the calculations). It is assumed that a fee for using the eco-mooring would be required to cover continued maintenance costs. For 10 eco-moorings, the total cost to visiting boats of such fees would be £0.271m/yr. The total cost of eco-moorings is taken to be the sum of the mooring fees and capital costs, plus any operating costs not covered by the mooring fees. The present value of the costs is £4.947m. The use of the Studland Bay study seems appropriate as this took into consideration the whole of the Solent area, including the Isle of Wight, and and vessel sizes and visitor activity are expected to be very similar in both locations. However, RYA has expressed concerns over the suitability of eco-moorings due to stronger tides and possibly more difficult seabed conditions in the Solent compared with those found in Studland Bay. RYA suggests that use of the more traditional and probably more costly EzyRider system might need to be considered if helical moorings are not considered adequate. If this system is required, the costs have been underestimated in the IA (RYA BS IA 3rd Tranche Feedback, March, 2012). Creation of no-anchoring zones would impact on recreational sea-anglers who anchor in the mud by fishing marks and do not use fixed moorings whilst

Table 2e. Recreational anchoring	**rMCZ 22, Bembridge**
Most vessels used for recreational angling in this area use the Natural England recommended rope risers, which have less environmental impact than alternative anchors (Tony Williams, BS IA 1st Tranche Feedback, January 2012).	fishing. Information on the likely impacts on anglers was not available.

Table 2f. Renewable energy – tidal energy **rMCZ 22, Bembridge**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

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

Management scenario 2: Increase in the costs of assessing environmental impacts for licence applications and provision of additional mitigation of the impacts of cable protection (relative to the mitigation provided in the baseline).

Baseline description of activity	**Costs of impact of rMCZ on the sector**
There is potential for future developments that generate electricity using the tidal energy resource in this rMCZ. The rMCZ overlaps the East of Isle of Wight Area of Potential, which has anticipated energy generation potential of 100 megawatts (Department of Energy and Climate Change, pers. comm., 2011). It is assumed for the purpose of the Impact Assessment (IA) that there would be one licence application within the timeframe of the IA. However, it is unlikely, though still possible, that deployment of tidal energy technology will take place in the rMCZ during the 20 year period covered by the IA.	The estimated cost to tidal energy developers of the rMCZ is expected to fall within the following range of scenarios: *£m/yr* | Scenario 1 | Scenario 2 Cost | 0.001 | 0.001 For Scenario 1, one licence application for tidal energy installations could be required to consider the potential effects of construction and operational activities on the features protected by the rMCZ and the potential to achieve the rMCZ conservation objectives. This is expected to result in one-off costs of £0.012m in 2015 (based on, per broad-scale habitat assessed, 6 days of a consultant's time at £700 per day plus 1 day for legal review at £800 per day) with a present value cost of £0.009m. For Scenario 2, the costs would be the same as for Scenario 1 plus the additional costs of mitigating impacts of cable protection. As the proposed cable routes are unknown, it is unclear whether routes for any inter-array or export cables will be sought that pass through the rMCZ and, if they are, what length of cable may be required. If alternative cable protection is required to mitigate impacts, this is estimated to cost £1.000m/km more than the cable protection that would have been used in the absence of the MCZ.

Table 2f. Renewable energy – tidal energy	rMCZ 22, Bembridge
	However, both Natural and JNCC have said that this additional requirement is unlikely to be needed and so this additional cost is anticipated to be unlikely (Natural England and JNCC, pers. comm., 2012).

Table 2g: Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ 22 Bembridge
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 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 Recommended Marine Conservation Zone (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) (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 22 Bembridge
Cables (interconnectors and telecom) Commercial fisheries (collection by hand and mid-water trawls) Flood and coastal erosion risk management (coastal defence) Recreation (except for the activities listed above in table 2) Research and education Shipping (except anchoring at St Helen's Road Anchorage) 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).

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 on definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ 22, Bembridge**
Baseline	**Beneficial impact**	
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. Seagrass beds, which occur within the rMCZ, generally provide important nursery areas for flatfishes (JNCC, 2011) and shellfish (Natural England website, seagrass beds article) and so are likely to help to support on-site and off-site fisheries (Fletcher and others, 2011). The rMCZ is also possibly a spawning area for commercial fish stocks, including Dover sole and mackerel. It is abundant in other fish species such as cod, herring and bass, and shellfish, including lobster, crab and prawns (Environmental Resources Management Ltd, 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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details). There is currently a relatively high on-site value derived from fish and shellfish services, principally through potting activity and to a lesser extent trawling, scalloping and netting. Commercial potters from Bembridge and Ventnor on the Isle of Wight and some from the mainland use the rMCZ. A description of on-site fishing activity and the value derived from it is set out in Table 2c. It has not been possible to estimate the value of the off-site benefits that derive from the seagrass nursery area.	If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (including seagrass) recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2c, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. As most of the commercial species targeted by fishers in this rMCZ are 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. The recovery of the seagrass beds to favourable condition may improve their functioning as a nursery area, potentially benefiting fisheries exploited within and outside the rMCZ. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation		**rMCZ 22, Bembridge**
Baseline	**Beneficial impact**	
Angling: 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. The seagrass beds provide important nursery areas for flatfishes (JNCC, 2011) and as such are likely to help to 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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details). The rMCZ is a popular area for both shore and boat angling. An estimated 212 local private angling boats use the rMCZ (Isle of Wight Angling Boat Survey, T Williams, 2011), excluding boats from the mainland. An estimated 5010 angling trips (including competitions) are made each year within this rMCZ (Shore Angling Intensity Report, T Williams, December 2010) with the most intense activity occurring during the summer months. Charter boats out of Bembridge, Langstone Harbour, Portsmouth, Southampton and Chichester bring anglers to the site as well (with up to 10 anglers on board at a time). As a spawning ground for Dover sole and mackerel and generally abundant in fish species due to the complex habitats within the site, it is likely to help to support potential on-site and off-site fisheries. Black sea bream, plaice, squid and smooth hound, as well as crustaceans (e.g. lobster) occur within this site and are fished commercially and recreationally (Balanced Seas Isle of Wight Sites Meeting Report, February 2011). To estimate the value of this rMCZ to anglers, Solent angling representatives suggested using national statistics for the average	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. The recovery of the seagrass beds to favourable condition may improve their functioning as a nursery area, potentially benefiting angling activities within and outside the rMCZ (see Table 4a). 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 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.	Anticipated direction of change:  Confidence: Low

Table 4b. Recreation		**rMCZ 22, Bembridge**
annual household expenditure of sea anglers (£295 per year) as detailed in the Drew Report (2004). Assuming that one prviate boat equals one household, private boat anglers spend £62,540 per year within this rMCZ. Using the national average number of trips made by shore anglers per year (13.62; Drew Ltd 2004), it can be estimated that 368 shore anglers use this rMCZ. Assuming that each shore angler equates to one household, shore anglers spend £108,560 per year within this rMCZ. 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 diversity of the rMCZ.		
Diving: The rMCZ is used for shore diving, particularly around Bembridge Ledge which is considered a good beginner's site and is also popular because of the interesting rock features and abundant marine life (www.isleofwighttouristguide.com/articles/scuba-diving-on-the-isle-of-wight/69/).	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 stalked jellyfish increase, this could lead to an improved quality of experience for divers. The designation may lead to an increase in diving 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 diving trips at the national scale.	Anticipated direction of change: ⇧ Confidence: Low
Wildlife watching: 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). The seagrass beds provide a safe haven for juvenile fish and other species such as sea horses, sea anemones and sessile jellyfish (Natural	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. The recovery of the seagrass beds (which occur over a large part of the chalk ledges) to favourable condition may improve their functioning as a safe haven for sessile and low mobility species. 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	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation		**rMCZ 22, Bembridge**
England website, seagrass beds article) and in this site they cover the chalk ledges which harbour and support diverse algae and invertebrate populations. These contribute to an area of high biodiversity in the north of the site which in turn supports the foraging birds and marine mammals that frequent it. The rMCZ is a popular area for wildlife watching, particularly birdwatching and rock-pooling. The northern part of the site has particularly high biodiversity, and extensive areas of limestone and chalk bedrock provide a complex system of crevices (Tyne and Bembridge Ledges), tunnels and pools supporting a very diverse algae and invertebrate fauna. This in addition to the abundant fish populations supports a number of foraging birds and offshore waterfowl such as great crested grebe. The area is the best foraging area for Sandwich tern in Balanced Seas project area. It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences. 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.	
Other recreation: 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 whole rMCZ is an extremely popular tourist destination especially for recreational sailing and coastal walking with numerous harbours, marinas, shopping facilities, camping sites and coastal paths available for visitors and residents. Sailing clubs offer races and training for all ages with the largest and most popular clubs and marinas situated in Seaview, Bembridge, Sandown Bay and Shanklin. It has not been possible to estimate the value derived from tourism in the rMCZ.	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. 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. 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.	Anticipated direction of change: ⇧ Confidence: Low

Table 4c. Research and education		**rMCZ 22, Bembridge**
Baseline	**Beneficial impact**	
Research: 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. Hampshire and Isle of Wight Wildlife Trust conducts research in the rMCZ including the Shoresearch and Seasearch programmes (surveys of the shore and sea bed). Southampton University may undertake academic research in the rMCZ. There is also archaeological interest within the foreshore and potentially in the subtidal areas with ongoing research being conducted by the Isle of Wight County Archaeology and Historic Environment Service. The Standing Conference on Problems Associated with the Coastline (SCOPAC) has also carried out research within this site (SCOPAC website). It has not been possible to estimate the value derived from research activities associated with the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. Hampshire and Isle of Wight Wildlife Trust may undertake education activities within the rMCZ. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events into the marine environment. Designation may aid additional local (to the rMCZ) provision of education (e.g. events, interpretation boards), from which visitors would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services		**rMCZ 22, Bembridge**
Baseline	**Beneficial impact**	
Regulation of pollution: the features of the site contribute to the bioremediation of waste (Native oysters, *Sabellaria*, seagrass beds and subtidal sediments), water filtration (Native oyster, *Sabellaria* and seagrass beds) and sequestration of carbon (Native oysters, *Sabellaria,* seagrass beds and subtidal sediments) (Fletcher and others, 2011). ***Environmental resilience:*** the features of the site (Native oyster and *Sabellaria)* contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** the features of the site, (Native oyster, *Sabellaria* and seagrass beds) in particularly the coastal saltmarshes, contribute to local flood and storm protection (Fletcher and others, 2011). It has not been possible to estimate the value derived from regulating services associated with the pMCZ.	If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (infralittoral rock, intertidal underboudler communities, peat and clay exposures, *Sabellaria* reefs and seagrass beds) recovered to favourable condition. Recovery of the seagrass beds may improve the regulating capacity of the habitat. 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.	Anticipated direction of change: ⟺ Confidence: Low

Table 4e. Non-use and option values		**rMCZ 22, Bembridge**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the pMCZ.	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. Examples of these values are shown in (Ranger, Lowe, Sanghera, & Solandt, 2012). Voters in the MCS's 'Your Seas Your Voice' campaign expressed the following: Features of the natural environment were strong motivators for reasons why people thought that certain areas	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ 22, Bembridge**
	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 facilities were 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. Source: Ranger et al. (2011)	

rMCZ 22 Reference Area 15 Tyne Ledges

Site area (km^2): 0.05

Table 1. Conservation impacts			**rMCZ 22, Reference Area 15 Tyne Ledges**	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) Reference Area lies within rMCZ 22 (Bembridge), to the south of Bembridge Harbour. It is primarily intertidal, extending out to the mean low water springs mark, and covers the Tyne Ledges which is the northern part of the well-known 'ledges' that extend along this stretch of coast. The wave-cut platforms contain large and slowly draining pools between the gently shelving ledges that provide habitat for the most important and extensive population of the alga Peacock's Tail *Padina pavonica* in the Balanced Seas Project Area, which is thought to seed the other populations around the Isle of Wight. Within the Balanced Seas Project Area, this species is found only on the Isle of Wight which is thought to be the eastern limit of the species distribution in the UK. The wider rMCZ in which this site lies has high biodiversity, including a diverse array of shellfish and demersal and pelagic fish (e.g. black sea bream, plaice, lobster and squid), migratory fish (e.g. Atlantic salmon, European eel and the rare twaite shad), foraging birds and offshore waterfowl (such as the great crested grebe), to which this site may contribute. The rMCZ Reference Area falls within the South Wight Maritime Special Area of Conservation and the Whitecliff Bay and Bembridge Ledges Site of Special Scientific Interest. 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**
Broad-scale habitats				
A5.2 Subtidal sand	-	-	Unfavourable condition	Recover to favourable condition
Habitats of Conservation Importance				
Seagrass beds	0.02	-	Unfavourable condition	Recover to favourable condition
Species of Conservation Importance				
Native Oyster *Ostrea edulis*[1]	-	-	-	-
Peacock's Tail (*Padina pavonica*)	-	14 records	Unfavourable condition	Recover to favourable condition

[1] Although listed in the Site Assessment Document (SAD) in the final report, this species is not found within the rMCZ Reference Area (See Final Recommendations Final Amendments Report for explanation).

Site-specific costs arising from the effect of the recommended Marine Conservation Zone (rMCZ) on human activities (over 2012 to 2031 inclusive)

Table 2a. Archaeological heritage	**rMCZ 22, Reference Area 15 Tyne Ledges**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in the costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
A British World War II landing craft is recorded within this site and a World War II pillbox is also recorded on the foreshore (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 for one licence application could be in the region of £500–£10,000, depending on the size of the rMCZ (English Heritage, pers. comm., 2012). If archaeologists respond to the prohibition of excavation 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. The prohibition of excavation will prevent interpretation of archaeological evidence from the site, thereby decreasing the acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

Table 2b. Ports, harbours, shipping and disposal sites	**rMCZ 22, Reference Area 15 Tyne Ledges**
Source of costs of the Recommended Marine Conservation Zone (rMCZ) ***Management scenario 1:*** Not applicable to this site. ***Management scenario 2:*** Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for all port and harbour developments within 5 km 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.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Port development: Bembridge is within 5km of the rMCZ Reference Area and may undergo development in the future	*£m/yr* | Scenario 1 | Scenario 2

Table 2b. Ports, harbours, shipping and disposal sites	**rMCZ 22, Reference Area 15 Tyne Ledges**
(Ports & 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).	Cost to the operator (port development) | N/A | 0.000 ***Scenario 1:*** Not applicable to this site ***Scenario 2:*** Future licence applications for port developments within 5km of this rMCZ Reference Area will need to consider the potential effects of the activity on the features protected by the rMCZ Reference Area. Additional costs will be incurred as a result (a breakdown of these by activity is provided in Annex N11).

Table 2c. Recreational angling	**rMCZ 22, Reference Area 15 Tyne Ledges**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Closure of the entire site to all recreational angling.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
The site is intertidal and covers an area where there is comparatively little angling (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011).	The boundaries of this rMCZ Reference Area were developed with the Local Group sea angling representatives to minimise the impact of the closure on recreational anglers (Balanced Seas Final Recommendations Amendments report, 2012). Due to the low level of activity within the rMCZ Reference Area, it is anticipated that the closure would not have a significant impact on anglers. Affected anglers would respond by fishing in alternative sites nearby.

Table 2a. Recreation – Walking (including dog walking)	**rMCZ 22, Reference area 15 Tyne Ledges**
Source of costs of the recommended Marine Conservation Zone (rMCZ) ***Management scenario 1 (uniform management):*** People walking through the rMCZ will be encouraged to use marked routes; dog walkers will be required to dispose of dog faeces in provided facilities.	
Baseline description of activity	**Costs of impact of MCZ on the sector**

Table 2a. Recreation – Walking (including dog walking)	**rMCZ 22, Reference area 15 Tyne Ledges**
The ledges are a very popular tourist destination for walkers and dog walkers (no numbers have been identified). The top of the beach is used by up to 20 dog walkers a day, and up to 50 in school holidays;. There is no Dog Control Order in place, and an estimated half dog walkers do not pick up the faeces (Natural England Stakeholder Interview for rMCZ Reference Area 15 Tyne Ledges, January 2012)	Given that walking would still be allowed in the site, impacts are likely to be negligible. Visitors would be encouraged to keep to the coastal footpath to avoid adverse effects. Impacts would include the cost of notifying visitors of the need to stay to designated paths (which is included in costs of managing the site). A Dog Control Order would need to be put in place that covered the rMCZ Reference Area. Dog walkers would be required to remove and dispose of dog faeces in provided facilities. Impacts would include the cost of putting the Dog Control order in place and notifying visitors of the need to remove dog faeces and of the location of the nearest disposal facility (which is included in costs of managing the site).

Table 2d: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 22 Reference Area 15 Tyne Ledges**
Oil and gas related activities (including carbon capture and storage) This rMCZ Reference Area overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 27th Seaward Licensing Rounds). However, it is unlikely that any oil and gas (including carbon capture and storage) infrastructure will be proposed in future in this rMCZ Reference Area due to its location and size (DECC, pers. comm., 2012). Impacts of rMCZ Reference Areas on oil and gas related activities are assessed in the Evidence Base, Annex H11 and Annex N 10 (they are not assessed for this site alone).	

Human activities in the site that are not negatively affected by the Recommended Marine Conservation Zone (rMCZ) (over 2012 to 2031 inclusive)

Table 3. Human activities in the site that are not negatively affected by the Recommended Marine Conservation Zone (rMCZ) (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 22 Reference Area 15 Tyne Ledges**
Flood and coastal erosion risk management (coastal defence) Recreation (except for the activities listed above in table 2) 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).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ 22, Reference Area 15 Tyne Ledges**	
Baseline	**Beneficial impact**	
Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption. Seagrass beds, which occur within the rMCZ Reference Area, generally provide important nursery areas for flatfish (JNCC, 2011) and shellfish (Natural England website, seagrass beds article) and so are likely to help to support on-site and off-site fisheries (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. There is minimal fishing in the rMCZ Reference Area due to its intertidal nature. It has not been possible to estimate the value of the off-site benefits that derive from the spawning and nursery area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ Reference Area. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Closure of the rMCZ Reference Area to fishing activity will reduce the on-site fishing mortality of species, but as the site is small it is unclear whether this would benefit stocks of mobile commercial finfish species. As no fishing will be permitted within the rMCZ Reference Area, no on-site benefits will be realised.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ 22, Reference Area 15 Tyne Ledges**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption and recreation services. Seagrass beds provide important nursery areas for flatfish (JNCC, 2011) and, as such, are likely to help to support potential on-site and off-site 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 some are in favourable condition and some are in unfavourable condition (see rMC 22 Table 1 for details). There is very little angling in this rMCZ Reference Area, as described in Table 2c. 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.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to closure of the rMCZ Reference Area. As angling will not be permitted within the rMCZ Reference Area, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers outside the rMCZ Reference Area. Such benefits may be insignificant.	Anticipated direction of change: ⇧ Confidence: Low
Diving: Diving is not known to take place in the site.	N/A	N/A
Wildlife watching: Wildlife watching is not known to take place in the site.	N/A	N/A
Other recreation: The coastal footpath runs along the top of the beach and is regularly used by walkers (up to 50 a day in winter; up to 100 a day in summer); horse riders also use the upper part of the beach. (Natural England Stakeholder Interview for rMCZ Reference Area 15 Tyne Ledges, November 2011).	N/A Although other recreation activities take place in this site, largely above MHW, the small area of the site means that no benefits to these activities are anticipated if the site is designated. In addition, the rMCZ Reference Area is fully contained within rMCZ 22 for which the benefits of other recreation have been assessed. It is not possible to identify whether the Reference Area will have additional benefits over and above this but this seems unlikely.	Anticipated direction of change: ⇧ Confidence: Low

Table 4c. Research and education	**rMCZ 22, Reference Area 15 Tyne Ledges**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. Hampshire and Isle of Wight Wildlife Trust conducts research in the wider rMCZ including the Shoresearch and Seasearch programmes (surveys of the shore and sea bed) which may overlap with the rMCZ Reference Area. It has not been possible to estimate the value derived from research activities associated with the rMCZ Reference Area.	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of education services. Hampshire and Isle of Wight Wildlife Trust may undertake education activities within the rMCZ Reference Area. It has not been possible to estimate the value derived from Reference Area education activities associated with the rMCZ Reference Area. .	MCZ Reference Area designation may provide an opportunity to expand the focus of education events into the marine environment. Designation may aid the development of additional local (to the rMCZ Reference Area) education activities(e.g. events and interpretation boards), from which visitors to the site would derive benefit. The Peacock's Tail is a species of considerable interest and could become a focus for educational work. Non-visitors may benefit if the rMCZ Reference Area contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services	**rMCZ 22, Reference Area 15 Tyne Ledges**	
Baseline	**Beneficial impact**	
Regulation of pollution: Seagrass beds contribute to the bioremediation of waste, water purification and sequestration of carbon (Fletcher and others, 2011).	If the conservation objectives of the features are achieved, the features will be recovered to reference condition.	Anticipated direction of change:

Table 4d. Regulating services	**rMCZ 22, Reference Area 15 Tyne Ledges**	
Environmental resilience: The features of the site contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** Seagrass beds contribute to local flood and storm protection (Fletcher and others, 2011). It has not been possible to estimate the value derived from regulating services associated with the rMCZ Reference Area.	Recovery of seagrass beds and closure to fishing could increase the site's benthic biodiversity and biomass, improving the regulating capacity of its habitats. Designating the recommended Marine Conservation Zone Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	 Confidence: Low

Table 4e. Non-use and option values	**rMCZ 22, Reference Area 15 Tyne Ledges**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) Reference Area and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of its 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 Reference Area 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.	Anticipated direction of change:  Confidence: Moderate

rMCZ 22 Reference Area 21 Culver Spit — Site area (km^2): 0.25

Table 1. Conservation impacts			**rMCZ 22, Reference Area 21 Culver Spit**	
1a. Ecological description				
This subtidal recommended Marine Conservation Zone (rMCZ) Reference Area lies south-east of Culver Down in rMCZ 22 (Bembridge) and contains the only record of living maerl beds *Phymatolithon calcareum* in the Balanced Seas Project Area. The rMCZ Reference Area is also considered to be suitable habitat for the short-snouted seahorse *Hippocampus hippocampus*; there are records showing it close to the site although not within the boundaries. The wider rMCZ in which this site lies supports high biodiversity, including a diverse array of demersal and pelagic fish and shellfish (e.g. black sea bream, plaice, lobster and squid), migratory fish (e.g. Atlantic salmon, European eel and the rare twaite shad), as well as foraging birds and offshore waterfowl (such as the great crested grebe), to which the rMCZ Reference Area may contribute. 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**
Broad-scale habitats				
A5.4 Subtidal mixed sediments	-	-	Unfavourable condition	Recover to favourable condition
Habitats of Conservation Importance				
Maerl beds	-	1 record	Unfavourable condition	Recover to favourable condition
Species of Conservation Importance				
Short snouted seahorse *Hippocampus hippocampus*	-	-	No records	No records

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

Table 2a. Archaeological heritage	**rMCZ 22, Reference Area 21 Culver Spit**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in the costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
The patrol boat HMS P12 (lost in 1918) is recorded within this 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

Table 2a. Archaeological heritage	**rMCZ 22, Reference Area 21 Culver Spit**
	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 for one licence application could be in the region of £500–£10,000 depending on the size of the rMCZ (English Heritage, pers. comm., 2012). If archaeologists respond to the prohibition of excavation 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. The prohibition of excavation will prevent interpretation of archaeological evidence from the site, thereby decreasing the acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

Table 2b. Commercial fisheries	**rMCZ 22, Reference Area 21 Culver Spit**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Closure of the entire site to all gear types.	
Summary of all fisheries: The rMCZ Reference Area is non-coastal, within the 6 nautical mile (nm) limit and lies in rMCZ 22 Bembridge. The main commercial fishing fleets using the general area and thus possibly fishing in the rMCZ Reference Area are based in Bembridge, Portsmouth and Selsey. Trawling, static netting, potting and lining operations by under 15 metre vessels is indicated to overlap with the site (information from interviews carried out for Fishermap). A Southern Inshore Fisheries and Conservation Authority (IFCA) byelaw prohibits the use of vessels over 12 metres in size within 6nm over an area that includes the site. The Southern IFCA has indicated that a maximum of 4 vessels operate at any one time within this rMCZ Reference Area (Southern IFCA email, feedback response to first tranche of IA material, 16 January 2012). More detail on the approach used for the fisheries method is provided in Annexes H7 and N4. Estimated value of UK net landings from the rMCZ Reference Area: £0.001 million per year (m/yr). (Due to resolution issues of the MCZ Fisheries Model and the small size of many rMCZ Reference Areas in the Balanced Seas region, some fisheries landings values may be inaccurate. They have been included as a precautionary measure and to avoid underestimating the economic impact of a site.)	
Baseline description of UK commercial fisheries	**Costs of impact of rMCZ on UK commercial fisheries**
Bottom trawls: At least two vessel owners indicated that their area of operation overlapped the rMCZ Reference Area (FisherMap Data 2010). The vessels target dover sole using trawls and beam	The estimated annual value of UK bottom-trawl landings affected: *£m/yr* | Scenario 1 Value of landings affected | <0.001*

<table>
<tr><th>Table 2b. Commercial fisheries</th><th>rMCZ 22, Reference Area 21 Culver Spit</th></tr>
<tr><td>trawls.

Estimated total value of landings from the rMCZ Reference Area: £40/yr (MCZ Fisheries Model).</td><td>* £40/yr</td></tr>
<tr><td>Hooks and lines:Two vessel owners who were interviewed indicated that their areas of operation overlap the rMCZ Reference Area (FisherMap Data 2010). The vessels use static lines to target bass.

Estimated value of UK net landings from the rMCZ Reference Area: £10/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £10/yr</td></tr>
<tr><td>Nets: Interviews with vessel owners indicated that the areas of operation of at least 7 vessels overlap the rMCZ Reference Area targetingbass, dover sole, plaice, European eel, skates and rays, using drift, fixed and gill nets (FisherMap Data 2010). Local Group discussions also indicated that the area is heavily fished using nets.

Estimated value of UK net landings from the rMCZ Reference Area: £190/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK net landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £190/yr</td></tr>
<tr><td>Pots and traps: Seven vessel owners who were interviewed for Fishermap have areas of operation that overlap the rMCZ Reference Area where they target whelks and common lobster (FisherMap Data 2010).

Estimated value of UK net landings from the rMCZ Reference Area: £0.001m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK pots and traps landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.001</td></tr></table></td></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td></td></tr>
</table>

Table 2b. Commercial fisheries — **rMCZ 22, Reference Area 21 Culver Spit**

The estimated annual value of UK landings and gross value added (GVA) affected:

£m/yr	Scenario 1
Value of landings affected	0.001
GVA affected	0.000

Baseline description of non-UK fisheries	**Costs of impact of rMCZ on non-UK commercial fisheries**
	None.

Table 2c. National defence — **rMCZ 22, Reference Area 21 Culver Spit**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

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

Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the site. The entire rMCZ Reference Area is covered by national defence covering the air, water column and sea bed. The main impacts on the rMCZ Reference Area are listed as: (i) air and water surface – noise, physical and visual disturbance; (ii) water column noise; and (iii) sea bed – fixed equipment. Activities include: acoustic trials, flares, mine countermeasures, smoke, seabed sampling and towed array (surveillance system).	It is not known whether this rMCZ Reference Area 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 22, Reference Area 21 Culver Spit**

Source of costs of the Recommended Marine Conservation Zone (rMCZ)

Management scenario 1: Not applicable to this site.

Management scenario 2: Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for all port and harbour developments within 5 km of the rMCZ Reference Area. 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

Table 2d. Ports, harbours, shipping and disposal sites **rMCZ 22, Reference Area 21 Culver Spit**

in the baseline.

Baseline description of activity	Costs of impact of rMCZ on the sector
Port development: There is 1 port (Bembridge) within 5km of the rMCZ Reference Area that may undergo development in the future (Ports & 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).	<table><tr><td>*£m/yr*</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Cost to the operator (port development)</td><td>N/A</td><td>0.000</td></tr></table> ***Scenario 1:*** Not applicable to this site. ***Scenario 2:*** Future licence applications for port developments within 5km of this rMCZ Reference Area will need to consider the potential effects of the activity on the features protected by the rMCZ Reference Area. Additional costs will be incurred as a result (a breakdown of these by activity is provided in Annex N11). .

Table 2e. Recreational anchoring **rMCZ 22, Reference Area 21 Culver Spit**

Source of costs of the Recommended Marine Conservation Zone (rMCZ)

Closure of the entire site to all recreational anchoring (except in emergency circumstances).

Baseline description of activity	Costs of impacts of MCZ on the sector
Local Group members indicated that anchoring of recreational vessels does not take place at a significant level in the rMCZ Reference Area (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011). One StakMap interviewee (representing 240 people per year) indicated that, although areas used for anchoring recreational vessels overlapped the rMCZ, the level of use is likely to be very low.	Given the low level of anchoring taking place in the rMCZ Reference Area, closure to anchoring is not expected to impact significantly on recreational vessel users. Local Group representatives of recreational sea anglers and charter boat operators indicated that they would accept a closure to anchoring if the rMCZ Reference Area is as small as possible (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011).

Table 2f. Recreational sea angling **rMCZ 22, Reference Area 21 Culver Spit**

Source of costs of the Recommended Marine Conservation Zone (rMCZ)

Closure of the entire site to all recreational angling.

Table 2f. Recreational sea angling	**rMCZ 22, Reference Area 21 Culver Spit**
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Twenty stakeholder interviewees, representing clubs and charter boat owners across the south coast (18 representing charter boat fishing; 2 representing private boat angling (representing 196 anglers)), indicated that their areas of activity overlap the rMCZ Reference Area (StakMap, 2010). Boat anglers (from the Solent and further afield) target smoothhounds, black bream and cod. Charter boats that use the site are based mainly in Langstone Harbour and represent 3,534 anglers per year. Only a small extent of the area that they fish overlaps the rMCZ Reference Area (StakMap, 2010).	Although the rMCZ Reference Area is used by recreational anglers, representatives of recreational anglers said that this rMCZ Reference Area would have little impact on anglers (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011). The representative of Bembridge Angling Club indicated that the rMCZ Reference Area would have little impact on club members as long as the area of the site is as small as possible (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011). No significant costs are expected.

Table 2g: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 22 Reference Area 21 Culver Spit**
Oil and gas related activities (including carbon capture and storage) This rMCZ Reference Area overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 27th Seaward Licensing Rounds). However, it is unlikely that any oil and gas (including carbon capture and storage) infrastructure will be proposed in future in this rMCZ Reference Area due to its location and size (DECC, pers. comm., 2012). Impacts of rMCZ Reference Areas 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 Recommended Marine Conservation Zone (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) (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 22, Reference Area 21 Culver Spit**
Recreation (except for the activities listed above in table 2) 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).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone rMCZ Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions can be found in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ 22, Reference Area 21 Culver Spit**
Baseline	**Beneficial impact**	
Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption. Subtidal coarse sediments are important nursery areas for many species and are potentially important spawning and nursery grounds for juvenile commercial species such as flatfish and bass (Fletcher and others, 2011). Maerl beds are also of benefit to fisheries, although it is not known how extensive the bed is in this site. 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 rMC 22 Table 1 for details). There is a small amount of on-site fishing activity in the rMCZ Reference Area, and the value derived from it is set out in Table 2b. It has not been possible to estimate the value of the off-site benefits that derive from any potential spawning and nursery area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ Reference Area. The costs of this are set out in Table 2b. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Closure of the rMCZ Reference Area to fishing activity will reduce the on-site fishing mortality of species, but as the site is small it is unclear whether this would benefit stocks of mobile commercial finfish species. As no fishing will be permitted within the rMCZ Reference Area, no on-site benefits will be realised.	Anticipated direction of change:  Confidence: Low

Table 4b. Recreation	**rMCZ 22, Reference Area 21 Culver Spit**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption and recreation services. Subtidal coarse sediments are important nursery areas for many fish species (Fletcher and others, 2011) and so may benefit recreational fisheries; maerl beds are also of benefit to fisheries, although it is not known how extensive the bed is in this site. 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 rMC 22 Table 1 for details). Angling is carried out by some local clubs and boats in this rMCZ Reference Area and a description of this activity is set out in Table 2f. 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.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to closure of the rMCZ Reference Area (see Table 4a). As angling will not be permitted within the rMCZ Reference Area, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers outside the rMCZ Reference Area. Such benefits may be insignificant.	Anticipated direction of change: ⇧ Confidence: Low
Diving: Diving may occur in the site but this has not been confirmed.	N/A	N/A
Wildlife watching: Wildlife watching is not known to take place in the site.	N/A	N/A
Other recreation: No other recreational activities are known to take place in the site.	N/A	N/A

Table 4c. Research and education	**rMCZ 22, Reference Area 21 Culver Spit**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. No known research activities take place in the site.	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of education services. No known educational activities take place in the site.	As the rMCZ Reference Area lies offshore and thus is relatively inaccessible, no benefits are likely to arise from direct use of the site for education.	

Table 4d. Regulating services	**rMCZ 22, Reference Area 21 Culver Spit**	
Baseline	**Beneficial impact**	
Regulation of pollution: Subtidal sediments contribute to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2011). ***Environmental resilience:*** N/A ***Natural hazard protection:*** As the site is offshore, its features do not contribute to the delivery of this service. It has not been possible to estimate the value derived from regulating services associated with the rMCZ Reference Area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of subtidal sediments and closure to fishing could increase the site's benthic biodiversity and biomass, improving the regulating capacity of its habitats. Designating the recommended Marine Conservation Zone Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ 22, Reference Area 21 Culver Spit**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) Reference Area and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of its 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 Reference Area 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.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ 23 Yarmouth to Cowes

Site area (km^2): 16.75

Table 1. Conservation impacts			**rMCZ 23, Yarmouth to Cowes**	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) would protect some of the most highly species-rich examples of Ross worm reef, several restricted habitats (e.g. peat and clay exposures and the best regional example of estuarine rocky habitats) and good examples of seagrass beds. Newtown Harbour, within the site, is home to wild populations of native oyster and a population of lagoon sand shrimp occurs in the salt pans. To the west of the Newtown Harbour entrance is Bouldnor Cliff, a 4 metre high underwater cliff containing peat layers and a submerged forest of tree boles and root systems, which is considered to be the only known submerged prehistoric primary site in British waters. Other notable features include hard-rock reefs and peacock worm, and intertidal underboulder communities with numerous boulders hosting a variety of sponges, seasquirts and crustaceans. The majority of the sea bed within the site is shown to be subtidal coarse sediment, which is part of a larger stretch of mixed subtidal gravel and sand habitat. Furthermore, the site is an important foraging area for common tern, great cormorant, little tern, Mediterranean gull and Sandwich tern. This site overlaps with the Solent Maritime Special Area of Conservation, Newtown Harbour Site of Special Scientific Interest (SSSI) and Thorness Bay SSSI, and is adjacent to the Yar Estuary SSSI. 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**
Broad-scale habitats				
A1.3 Low energy intertidal rock	0.01	-	Favourable condition	Maintain at favourable condition
A2.1 Intertidal coarse sediment	0.03	-	Favourable condition	Maintain at favourable condition
A3.2 Moderate energy infralittoral rock	0.21	-	Unfavourable condition	Recover to favourable condition
A5.1 Subtidal coarse sediment	11.99	-	Favourable condition	Maintain at favourable condition
Habitats of conservation importance				
Estuarine rocky habitats	81 m^2	-	Favourable condition	Maintain at favourable condition
Intertidal underboulder communities	-	2 records	Unfavourable condition	Recover to favourable condition
Native oyster beds	-	21 records	Favourable condition	Maintain at favourable condition
Peat and clay exposures	-	8 records	Unfavourable condition	Recover to favourable condition
Rossworm (*Sabellaria spinulosa*)	313.38 m^2	-	Unfavourable condition	Recover to favourable condition
Seagrass beds	-	1 record	Unfavourable condition	Recover to favourable condition
Species of conservation importance				
Lagoon Sand Shrimp (*Gammarus insensibilis*)	-	2 records	Favourable condition	Maintain at favourable condition
Native Oyster (*Ostrea edulis*)	-	25 records	Favourable condition	Maintain at favourable condition

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

Table 2a. Archaeological heritage	**rMCZ 23, Yarmouth to Cowes**
Source of costs of the Recommended Marine Conservation Zone (rMCZ)	
Increase in the 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 be placed on: • anchoring in areas of vulnerable rMCZ features in the site, including seagrass and Ross worm *Sabellaria spinulosa* reef; • archaeological excavation in areas of peat and clay exposures in the site.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
A World War II bombing decoy area is in the site. Roman and Neolithic artefacts have been found within the site. Wrecked vessels of British, Spanish, German, French and Dutch origin have been recorded within the site; of these vessels, 1 is protected by the Protection of Wrecks Act 1973 (the *Yarmouth Roads*) with a 50-metre exclusion zone. Yarmouth Pier is also a designated monument. A bronze-age burial site, a late iron-age cremation cemetery and several cup marks have been recorded within the site. Bouldnor cliff underwater Mesolithic site has been subject to archaeological investigation since the late 1990s (English Heritage, 2012). Since 2003, 1 survey licence has been granted each year for the *Yarmouth Roads* wreck. English Heritage has indicated that this site is likely to be of interest for archaeological excavation in the future as it is relevant to its National Heritage Protection Plan (theme 3A1.2)	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 for one licence application could be in the region of £500–£10,000, depending on the size of the rMCZ (English Heritage, pers. comm., 2012). No further impacts on activities related to archaeology are anticipated. If archaeologists respond to restrictions on excavation in areas of peat and clay exposures and restrictions on anchoring over areas of seagrass or ross worm (*Sabellaria spinulosa*) 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 these restrictions, this will prevent interpretation of archaeological evidence from the site, thereby decreasing the acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

Table 2b. Commercial fisheries	**rMCZ 23, Yarmouth to Cowes**
Source of costs of the Recommended Marine Conservation Zone (rMCZ)	
The Joint Nature Conservation Committee 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 management 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.	
Management scenario 1: Closure of the entire rMCZ to bottom trawls and dredges to protect areas of seagrass beds and ross worm (*Sabellaria spinulosa*) reef (SNCBinformed scenario).	
Management scenario 2: Closure of the entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps to protect areas of seagrass beds, infralittoral rock, peat and clay exposures, and Ross worm *Sabellaria spinulosa* reef (SNCB informed scenario).	
Summary of all fisheries: The rMCZ is wholly within the 6 nautical mile (nm) limit and is fished only by UK vessels. Vessels from Cowes, Lymington, Keyhaven and Portsmouth/Gosport fish this rMCZ and potting is the most important fishing activity. In recent years cuttlefish trapping has also been a financially valuable activity. Oyster dredging has historically been an important activity, and oyster dredgers from various other ports, including Hamble and Southampton, fish the area if oyster beds develop. Recently, effort has been low due to a shortage of oysters. There is also longlining but very little set netting. There are no vessels over 12 metres fishing this area as an Inshore Fisheries and Conservation Authority (IFCA) byelaw states that all vessels must be under 12 metres in size within 6nm (Southern IFCA, pers. comm., 2012). Southern IFCA considers that a maximum of 4 vessels operate at any one time in this rMCZ (Southern IFCA, pers. comm., 2012) . More detail on the approach used for the fisheries method is provided in Annexes H7 and N4. Certain commercial fishing restrictions are already in existence (listed in Annex E1). The Southern IFCA is currently developing a Seagrass Management Strategy which through a voluntary code of conduct will close of areas of sea grass to bottom trawls and dredges around the Isle of Wight (from mean high water out to a distance that is currently being determined) (Jury, J. from Southern IFCA email., 24 April 2012; The SIFCA and the Seagrass Working Group (SWG). 2012). This will partially deliver the management that is required for Scenarios 1 and 2. Estimated annual value of landings from the rMCZ: £0.091 million per year (m/yr) (this is likely to be an overestimate due to the future implementation of the Southern IFCA byelaw to protect areas of seagrass).	
Costs of impact of rMCZ on UK commercial fisheries	**Costs of impact of rMCZ on UK commercial fisheries**
Bottom trawls: The Southern IFCA has indicated that a maximum of 4 under 15 metre vessels operate in this area at any one time (Southern IFCA, pers. comm., 2012).	The estimated annual value of UK bottom-trawl landings affected is expected to fall within the following range of scenarios:

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 23, Yarmouth to Cowes</th></tr>
<tr><td>Estimated total value of landings from the rMCZ: £0.009m/yr (MCZ Fisheries Model).

The above figures are likely to be overestimates as the Fisheries Model overestimates the number of vessels trawling in the site.</td><td><table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.009</td><td>0.009</td></tr></table>
The above values are likely to be overestimates as the Fisheries Model overestimates the number of vessels trawling in the site, and the implementation of the Southern IFCA Seagrass Management Strategy to protect areas of sea grass through a voluntary code of conduct will significantly reduce the activity of bottom trawls in this rMCZ (Jury, J., Southern IFCA email., 24 April 2012).</td></tr>
<tr><td>Dredges: The Southern IFCA has indicated that a maximum of 4 under 15 metre vessels operate in this area at any one time (Southern IFCA email, feedback response to first tranche of IA material, 16 January 2012).
Estimated total value of landings from the rMCZ: £0.031m/yr (MCZ Fisheries Model).
The above figures are likely to be overestimates as the Fisheries Model overestimates the number of vessels dredging in the site.</td><td>The estimated annual value of UK dredge 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>0.031</td><td>0.031</td></tr></table>
The above values are likely to be overestimates as the Fisheries Model overestimates the number of vessels dredging in the site, and the implementation of the Southern IFCA Seagrass Management Strategy to protect areas of sea grass through a voluntary code of conduct will significantly reduce the activity of dredges in this rMCZ (Jury, J., Southern IFCA email., 24 April 2012).</td></tr>
<tr><td>Hooks and lines: The Southern IFCA has indicated that a maximum of 4 under 15 metre vessels operate in this area at any one time (Southern IFCA email, feedback response to first tranche of IA material, 16 January 2012).

Estimated total value of landings from the rMCZ: £0.002m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line 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>0.002</td></tr></table>
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..</td></tr>
<tr><td>Nets: The Southern IFCA has indicated that a maximum of 4 under 15 metre vessels operate in this area at any one time</td><td>The estimated annual value of UK net landings affected is expected to fall within the following range of scenarios:</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 23, Yarmouth to Cowes</th></tr>
<tr><td>(Southern IFCA email, feedback response to first tranche of IA material, 16 January 2012).

Estimated total value of landings from the rMCZ: £0.012m/yr (MCZ Fisheries Model).</td><td><table><tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Value of landings affected</td><td>0.000</td><td>0.012</td></tr></table>
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.</td></tr>
<tr><td>Pots and traps: The Southern IFCA has indicated that a maximum of 4 under 15 metre vessels operate in this area at any one time (Southern IFCA email, feedback response to first tranche of IA material, 16 January 2012).
Estimated total value of landings from the rMCZ: £0.037m/yr (MCZ Fisheries Model).</td><td>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>0.037</td></tr></table></td></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td></td></tr>
<tr><td></td><td>The estimated annual value of UK landings and gross value added (GVA) 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>0.040</td><td>0.091</td></tr><tr><td>GVA affected</td><td>0.019</td><td>0.043</td></tr></table>
The above values are likely to be overestimates as the Fisheries Model overestimates the number of vessels fishing in the site, and the implementation of the Southern IFCA Seagrass Managment Strategy to protect areas of sea grass through a voluntary code of conduct will close areas of sea grass to bottom trawls and dredges around the Isle of Wight. (Jury, J., Southern IFCA email, 24 April 2012).</td></tr>
<tr><td>Baseline description of non-UK fisheries</td><td>Costs of impact of rMCZ on non-UK commercial fisheries</td></tr>
<tr><td></td><td>None.</td></tr>
</table>

Table 2c. Ports, harbours, shipping and disposal sites **rMCZ 23, Yarmouth to Cowes**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

Management scenario 1: 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 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.

Management scenario 2: 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 to update the existing Maintenance Dredging Protocol (MDPs) for Southampton Water , Yarmouth and Lymington. 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**
Disposal sites:. There is 1 site (WI080 Hurst Fort) within 5km of the rMCZ which is licensed for disposal of channel dredge material. The average number of licence applications received for this disposal site is 2.9 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011). Hurst Fort dumping ground is used every winter by Lymington Harbour Commissioners, Berthon Marina (Lymington), Yacht Haven Marina (Lymington) and Yarmouth Harbour Commissioners (Lisher, C. email, feedback response to first tranche of IA material, 6 January 2012). ***Navigational dredge areas:*** There is licensed maintenance and navigational dredging within 1km of this rMCZ associated with the Yarmouth Harbour Commission and with the main shipping channel associated with Southampton Port. 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.	<table><tr><td>*£m/yr*</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Total</td><td>0.002</td><td>0.007*</td></tr></table> * 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 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. ***Scenario 1:*** 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).

Table 2c. Ports, harbours, shipping and disposal sites	**rMCZ 23, Yarmouth to Cowes**
Within 5km of this rMCZ, maintenance and navigational dredging is carried out by the Yarmouth Harbour Commission, Southampton Port and the Port of Lymington. It is assumed that each dredge area's marine licence is renewed once every 3 years, and that an assessment of environmental impact upon rMCZ features is undertaken for each licence renewal. As these navigational dredge areas are covered by existing MDPs, it is assumed that the assessment of environmental impact is not changed over the 20 year period of the IA. ***Port development:*** There are three ports within 5km of the rMCZ that may undergo development in the future: Yarmouth, Lymington and Keyhaven (Ports & 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).	***Scenario 2:*** Future licence applications for disposal of material, navigational dredging and port or harbour 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). Additional costs will be incurred in the update of the existing Maintenance Dredging Protocols (MDPs) 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. ***Additional concerns raised by a stakeholder:*** If use of the Hurst Fort disposal site were restricted in any way, the costs of dredging for all facilities in the Lymington and Yarmouth area would escalate as the other disposal sites (Needles and Nab) are further away and require larger vessels (Lisher, C. email, feedback response to first tranche of IA material, 6 January 2012).

Table 2d. Recreational Anchoring	**rMCZ 23, Yarmouth to Cowes**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Creation of no-anchoring zones for recreational vessels (except in emergency circumstances) over areas of moderate-energy infralittoral rock, intertidal underboulder communities, and Ross worm *Sabellaria spinulosa* reef. Creation of no-anchoring zones over areas of seagrass bed and installation of permanent eco-moorings In appropriate locations (assuming that the mooring structures provide the necessary mitigation of impacts on the feature). Also mitigation of impacts of anchoring racing marks in areas of seagrass beds.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Overview: The stretch of coastline from Yarmouth to Cowes is a popular area for recreational boating. It is located within the western Solent, a globally renowned sailing destination and home to Cowes Week, the largest sailing regatta of its kind in the world. Yarmouth, situated at the western end of the rMCZ, is possibly the busiest single tourist and recreational vessel destination in the Solent, if not on the south coast. It is a stopping-off point for vessels to and from the Channel Islands and northern France and for those heading further west along the south coast.	

Table 2d. Recreational Anchoring	**rMCZ 23, Yarmouth to Cowes**
Two sailing clubs adjacent to the harbour with almost 2,000 members, and 7 clubs in and around the Cowes area with 2,500 members, use this rMCZ and potentially anchor in it. The yachting activity brings direct employment to local people and business as well as attracting visitors to the area, which further contributes to the economy (RYA BS IA 1st Tranche Feedback, January, 2012). In terms of charter boats, 3 angling charters from Yarmouth Harbour, 6 from Keyhaven Harbour, 9 from Lymington Harbour on the mainland and 2 diving charters from Yarmouth Harbour potentially anchor in the rMCZ (StakMap). The Solent Local Group angling representatives have said that 112 private sea-angling boats are launched from Yarmouth and over 290 boats could potentially use and anchor in the rMCZ. The inshore area of the rMCZ, which coincides with all features recommended for protection, has a medium intensity of sea angling with 13 to 24 private boats operating at any given time depending on the season (Williams, T, Isle of Wight Angling Intensity Report, 2010). It can be assumed that these private boats will anchor on the features. (Information is provided below for the baseline and impacts for each feature as the features cover different areas.	
Moderate-energy infralittoral rock: This feature occurs just west of Thorness Bay along the Salt Mead Ledges within the rMCZ. StakMap data show that 1 sailing club uses this area for anchoring as part of a wider area. Five sea-angling clubs and 7 charter boats that use the area for fishing anchor anywhere depending on weather and tides (StakMap data). Solent Local Group sea-angling representatives said that small dinghies anchor here with light anchors (Balanced Seas Isle of Wight site meeting report, February, 2011).	***Moderate-energy infralittoral rock:*** Since the feature is intertidal, the intensity of anchoring is expected to be low. Creation of no anchoring zones over the feature is not expected to result in significant impacts or costs. It is anticipated that vessels that anchor over the feature will respond by anchoring in suitable alternative areas in the vicinity.
Intertidal underboulder communities: This feature occurs within the rMCZ between Egypt Point and Gurnard Head, just to the east of Gurnard Ledges. StakMap data show that 33 sailing clubs use this general area for anchoring. Stakeholders report that racing buoys with light anchors are laid seasonally in the general area of the rMCZ, but they are usually not laid this far inshore (Balanced Seas Isle of Wight site meeting report, February, 2011). Five sea-angling clubs and 7 charter boats fish in this part of the rMCZ and may anchor there depending on weather and tides (Stakmap, 2010).	***Intertidal underboulder communities:*** Participants at the Solent Local Group meeting in July 2011 said that, since this is an intertidal habitat, anchoring only occurs when the tide is in, and so overall anchoring activity is expected to be very low. Therefore, impacts on recreational anchoring of creation of no anchoring zones over areas of the feature are expected to be minimal, with no significant costs expected.
Ross worm* Sabellaria spinulosa *reef: This occurs just outside the mouth of Newtown Harbour, on the east site of the approach channel, within the rMCZ. StakMap data show intense use of the general area where Rossworm reef occurs. Between 25 and 33 sailing clubs using the area around the Rossworm reef for anchoring (Stakmap, 2010) and this has	***Ross worm Sabellaria spinulosa reef:*** The distribution of this feature needs to be verified, but if the record held by the project is correct and it occurs only on the east side of the approach channel into Newtown Harbour, a no-anchoring zone would not impact on the recreational sector (Local Group meeting, 2011). The anchoring described in the baseline relates to the general

Table 2d. Recreational Anchoring	**rMCZ 23, Yarmouth to Cowes**
been confirmed by other stakeholders. Anchoring is mainly undertaken on the west side of the approach channel into Newtown Harbour (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011). Five sea-angling clubs and 7 charter boats highlighted the area as important for fishing, and anglers may anchor there depending on weather and tides. There is thus little specific evidence for actual overlap of anchoring and Rossworm reef.	area and is not specific to the small location where the feature occurs. Survey costs have been included in monitoring costs in Annex N12.
Seagrass beds: This feature occurs in the rMCZ from the western boundary, across the mouth of the River Yar up to Yarmouth, with a small patch by Bouldnor. StakMap data show that 8 sailing clubs use the area as a potential anchoring spot. Royal Solent Yacht Club, adjacent to Yarmouth Harbour, lays racing marks in 6 areas that overlap the seagrass beds. The rMCZ covers 2 areas of the Club's moorings that are licensed by the Crown Estate and which the Club has requested are excluded from the rMCZ. Even if the Club had space to store them, it is not practical to lift the main types of boat that race at the Club out of the water between races, as they are traditional, heavy, often wooden keelboats. Also, there is not enough space in the harbour to keep afloat those boats that race twice a week throughout the season (RYA BS IA 2nd Tranche Feedback, February, 2012). Solent recreation representatives said that existing moorings would need to be maintained (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011). This could impact on the seagrass beds Five sea-angling clubs and 7 charter boats interviewed highlighted the area as important for fishing. They may anchor in the areas of seagrass depending on the weather and tides (StakMap, 2010). Yarmouth has 250 resident berths and 250 visitor berths; this includes 38 visitor moorings north of the breakwater outside the harbour at Yarmouth Roads for overspill which are laid and made available from April to September. Closer inshore, there is a permanent small-craft anchorage near the breakwater, and small-craft moorings east of Yarmouth Pier; these all overlap the seagrass beds (RYA BS IA 2nd Tranche Feedback,	***Seagrass beds:*** To mitigate impacts on the sea grass the management scenario that is used for the IA entails creation of no-anchoring zone over the seagrass beds, replacement of existing moorings in the areas of seagrass beds with eco-moorings and installation of further eco-moorings to mitigate impacts on the seagrass. This is suggested because of the potential impacts of existing moorings and the high level of anchoring and mooring over the seagrass, particularly in the summer. If additional moorings were not provided it is anticipated that this would result in significant displacement of anchoring into surrounding areas. Vessels would anchor in alternative areas to the west, in Alum Bay and Totland Bay (which occurs in rMCZ 20); to the east, in Newtown Harbour (parts of which are within an rMCZ Reference Area); or north on the other side of the Solent. This could increase travel costs for vessel users and greenhouse gas emissions. It would also result in loss of business for facilities in Yarmouth that provide services to vessel users. Costs have been estimated using the approach used for eco-mooring installation in Studland Bay (Marina Projects, 2011). Capital costs for the installation of 100 eco-moorings, which would accommodate the maximum level of anchoring in the rMCZ, are estimated to total £0.433m (see Annex H12 for the assumptions used in the calculations). This is a one-off cost assumed to occur in the first year after designation (2013) and includes the cost of removing and replacing the existing moorings at Yarmouth Harbour and Royal Solent Yachting Club. Operating costs, including maintenance of the eco-moorings and collection of mooring fees, are estimated to total £0.087 million per year (m/yr) (see Annex N12 for the assumptions used in the calculations). It is assumed that a fee for using the eco-mooring would be required to cover

Table 2d. Recreational Anchoring	**rMCZ 23, Yarmouth to Cowes**
February, 2012).	continued maintenance costs. For 100 eco-moorings, the total cost to visiting boats of such fees would be £0.090m/yr. (See Annex N12 for a full breakdown of costs and assumptions.) Yarmouth Harbour has indicated that an increase in mooring costs will put off visitors, especially those from abroad, and will cause a loss of income for the harbour and local businesses (C. Lisher, BS IA response, 2012). The total cost of eco-moorings is taken to be the sum of the mooring fees and capital costs, plus any operating costs not covered by the mooring fees. The present value of the costs is £1.700m. The use of the Studland Bay study seems appropriate as this took into consideration the whole of the Solent area, including the Isle of Wight, and vessel sizes and visitor activity are expected to be very similar in both locations. However, RYA has expressed concerns over the suitability of the eco-moorings due to stronger tides, which would put much more load onto the moorings than would normally be expected (off Yarmouth on the ebb, a spring tide can run at 4 knots) (Yarmouth Harbour Master, IA response, 2012) and possibly more difficult seabed conditions in the Solent compared with those found in Studland Bay. RYA suggests that use of the more traditional and probably more costly EzyRider system might need to be considered, if the helical moorings are not considered adequate. This would result in costs that are greater than those estimated in the IA (RYA BS IA 3rd Tranche Feedback, March, 2012). The impacts of racing marks laid out seasonally by the Royal Solent Yacht Club may be mitigated through using more environmentally friendly ground tackle, if this provides sufficient mitigation. Costs for suitable tackle were not available to inform this IA. If such mitigation is not sufficient, closure of the area to anchoring of racing marks would impact significantly on the club's activities and could make the club financially unviable since its primary function is the organisation of races and regattas (RYA BS IA 2nd Tranche Feedback,

Table 2d. Recreational Anchoring	**rMCZ 23, Yarmouth to Cowes**
	February, 2012). This would impact on its members and local businesses that provide services to them.

Table 2e. Renewable energy – tidal energy **rMCZ 23, Yarmouth to Cowes**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

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

Management scenario 2: Increase in the costs of assessing environmental impacts for licence applications and provision of additional mitigation of the impacts of cable protection (relative to the mitigation provided in the baseline).

Baseline description of activity	**Costs of impact of rMCZ on the sector**
The rMCZ is adjacent to the Solent Energy nearshore deployment site, which has a potential capacity of 1 megawatt (MW) and is scheduled for development by 2015. It is part of the tidal energy project that is being implemented by the Solent Ocean Energy Centre (SOEC), which plans to install capacity totalling 21MW around the Isle of Wight (it has started initial trials) (SOEC, 2011). The Isle of Wight Council has indicated that this is one of the few areas in the UK where this technology could be implemented (Isle of Wight Council, pers. comm., March 2012). It is assumed for the purpose of the Impact Assessment (IA) that there would be one licence application within the time frame of the IA.	The estimated cost to tidal energy developers of the rMCZ is expected to fall within the following range of scenarios: *£m/yr* / Scenario 1 / Scenario 2 Cost / 0.001 / 0.001 For Scenario 1, If the rMCZ were designated, one licence application for the tidal energy installation will be required to consider the potential effects of construction and operational activities on the features protected by the rMCZ and the potential to achieve the rMCZ conservation objectives. This is expected to result in additional one-off costs of £0.013m in 2015 (based on, per broad-scale habitat assessed, 6 days of a consultant's time at £700 per day plus 1 day for legal review at £800 per day) with a present value cost of £0.012m. For Scenario 2, the costs would be the same as for Scenario 1 plus additional costs of mitigating the impacts of cable protection. As the proposed cable routes are unknown, it is unclear whether routes for any inter-array or export cables will be sought that pass through the rMCZ, and if they are what length of cable protection may be required. If alternative cable protection is required to mitigate impacts, this is estimated to cost £1.000m/km more than the cable protection that would have been used in the absence of

Table 2e. Renewable energy – tidal energy	rMCZ 23, Yarmouth to Cowes
	the MCZ. However, both Natural England and JNCC have said that this additional requirement is unlikely to be needed and so this additional cost is anticipated to be unlikely (Natural England and JNCC, pers. comm., 2012). ***Additional concerns raised by stakeholders:*** Both the industry and the Isle of Wight Council consider that additional baseline monitoring and ongoing monitoring will be required as a result of rMCZ designation and that the costs of this will be substantial, particularly for ongoing monitoring. It has estimated these will cost up to 20% of total project costs (which is £33.500m in total), or approximately £10.050m per year. As SOEC is conceived as a test and demonstration facility for numerous tidal energy devices, it has been suggested that any additional costs may need to apply to each device that is deployed (Fawcett. J tidal energy lead for the Isle of Wight Council., email, 7 March 2012.). The industry has not been able to provide further details of estimated costs of impact (which it anticipates may arise in avoiding impacts on sensitive features, for cable protection, repowering and recommissioning). This is because tidal energy is still a very new industry and there are many unknown contributory factors (Fawcett. J, tidal energy lead for the Isle of Wight Council, email., 7 March 2012.).

Table 2f: Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ 23, Yarmouth to Cowes
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 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 Recommended Marine Conservation Zone (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) (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 23, Yarmouth to Cowes**
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).

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 4a. Fish and shellfish for human consumption		**rMCZ 23, Yarmouth to Cowes**
Baseline	**Beneficial impact**	
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. Intertidal rock habitats are important sources of larval plankton, upon which commercially important fish species feed, including mussel beds and larval fish of plaice and mackerel. Intertidal coarse sediment provides a scavenging area for fish, which supports commercial fisheries. Infralittoral rock is an important location for commercial inshore fishing activity, particularly for crab and lobster. Subtidal coarse sediment is an important nursery area for many species and provides potentially important spawning and nursery grounds for	If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (including seagrass) recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. As most of the commercial species targeted by fishers in this rMCZ are shellfish, it is unclear whether the scale of habitat recovered and the magnitude of reduced (on-site) harvesting will be enough	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ 23, Yarmouth to Cowes**
juvenile commercial species such as flatfishes and bass. Seagrass beds, which occur within the rMCZ, generally provide important nursery areas for flatfishes (Joint Nature Conservation Committee, 2011) and shellfish (Natural England website, seagrass beds article) and so are likely to help support on-site and off-site fisheries (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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details). Potting is the most important fishing activity. Oyster dredging is historically an important activity and, in recent years, cuttlefish trapping has also been a financially valuable activity. Oyster dredgers from various other ports, including Hamble and Southampton, fish the area if oyster beds develop. Recently effort has been low due to a shortage of oysters. There is also long lining activity. A description of on-site fishing activity and the value derived from it is set out in Table 2b. It has not been possible to estimate the value of the off-site benefits which derives from the seagrass nursery area.	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. The recovery of the seagrass beds to favourable condition may improve their functioning as a nursery area, potentially benefiting fisheries exploited within and outside the rMCZ. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.	

Table 4b. Recreation		**rMCZ 23, Yarmouth to Cowes**
Baseline	**Beneficial impact**	
Angling: 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. The subtidal coarse sediments and infralittoral rock within this rMCZ support high biodiversity and, as such, are likely to help support potential on-site and off-site angling activities (Fletcher and others,	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. The recovery of the seagrass beds and infralittoral rock to favourable condition may improve their functioning as a nursery area, potentially benefiting angling activities within and outside	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation		**rMCZ 23, Yarmouth to Cowes**
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 some are in favourable condition and some are in unfavourable condition (see Table 1 for details). The rMCZ is a popular area for both shore and boat angling. Due to the complex habitats within the site, it provides suitable habitat for many commercial fish species important for recreational angling, which is likely to help support potential on-site and off-site fisheries. An estimated 262 local private angling boats use this rMCZ (Isle of Wight Angling Boat Survey, T Williams, 2011), excluding boats the mainland. An estimated 2170 angling trips are made each year within this rMCZ including competitions (Shore Angling Intensity Report, T Williams, December 2010) with the most intense activity occurring during the summer months. Charter boats out of Yarmouth, Lymington and Southampton bring anglers to the site and charter boats from west of the project area use the site as well. To estimate the value of the site to anglers, Solent angling representatives have suggested using national statistics for the average annual household expenditure of sea anglers (£295 per year) as detailed in the Drew Report (2004). Assuming that one prviate boat equals one household, private boat anglers spend £77,290 per year within this rMCZ. Using the national average number of trips made by shore anglers per year (13.62; Drew Ltd 2004), it can be estimated that 159 shore anglers use this rMCZ. Assuming that each shore angler equates to one household, shore anglers spend £47,001 per year within this rMCZ. 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 estuary spawning and nursery area.	the rMCZ (see Table 4a). 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 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.	

Table 4b. Recreation		**rMCZ 23, Yarmouth to Cowes**
Diving: 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 rMCZ is used for diving and is popular both for wreck dives and for its abundant marine life (www.isleofwighttouristguide.com). It has not been possible to estimate the value derived from diving in the rMCZ.	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 stalked jellyfish increase, this could lead to an improved quality of experience for divers. The designation may lead to an increase in diving 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 diving trips at the national scale.	Anticipated direction of change: ⇧ Confidence: Low
Wildlife watching: 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). The seagrass beds provide a safe haven for juvenile fish and other species such as sea horses, sea anemones and sessile jellyfish (Natural England website, seagrass beds article). These may contribute to an area of high biodiversity, which in turn supports foraging areas for sea birds. The rMCZ is a popular area for wildlife watching, particularly bird watching in Newtown Harbour where there are many waders and wildfowl in winter; breeding terns and gulls in summer and little egrets and grey herons all year round (Fat Birder Website). Grey seals and bottlenose dolphins are seen regularly in the Western Solent where the marine traffic is less intense (Isle of Wight County press Online and Cowes Online) and mammal-watching may therefore be undertaken from this rMCZ.	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. The recovery of the seagrass beds and infralittoral rock to favourable condition may improve their functioning as a safe haven for sessile and low mobility species. Any associated increase in abundance and diversity of species that are visible to wildlife watchers may improve the quality of wildlife watching at the site and therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences. 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.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation		**rMCZ 23, Yarmouth to Cowes**
It has not been possible to estimate the value derived from wildlife watching in the rMCZ.		
Other recreation: 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 whole rMCZ is an extremely popular tourist destination, especially for recreational sailing (www.redfunnel.co.uk/island-guide/things-to-do/sailing), charter boats and coastal walking (www.wight-cam.co.uk/WightCAM/HTML/CoastalPath&InlandTrails/BW-Stage4.htm) with numerous harbours, marinas, shopping facilities, camping sites and coastal paths available. It has not been possible to estimate the value derived from recreation and tourism services in the rMCZ.	If the conservation objectives of the features are achieved, some of the features, including the seagrass beds, will be recovered to favourable condition. Others will be maintained in favourable condition. 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. 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.	Anticipated direction of change: ⇧ Confidence: Low

Table 4c. Research and education		**rMCZ 23, Yarmouth to Cowes**
Baseline	**Beneficial impact**	
Research: 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. Hampshire and Isle of Wight Wildlife Trust is very active in the area, regularly conducting sea floor and sea shore surveys through Seasearch and Shoresearch (www.hwt.org.uk/events.php) and collating public sightings of marine mammals which are submitted to the Dorset Marine Mammal Research Programme and the South Coast Seal Project (Hampshire and IOW Wildlife Trust Website). The Standing Conference on Problems Associated with the Coastline (SCOPAC) also carries out research within this site, across the region	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.	Anticipated direction of change: ⇧ Confidence: High

between Lyme Regis and Shoreham (SCOPAC website). It has not been possible to estimate the value derived from research activities associated with the rMCZ.		
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. Hampshire and Isle of Wight Wildlife Trust provides practical and theoretical learning opportunities as either taught lessons at its centres or as outreach in schools (Hampshire and Isle of Wight Wildlife Trust website). It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events into the marine environment. 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. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services	**rMCZ 23, Yarmouth to Cowes**
Baseline	**Beneficial impact**

Regulation of pollution: The features of the site contribute to the bioremediation of waste (subtidal sediments, native oyster, *Sabellaria* and seagrass beds), water filtration (native oyster, *Sabellaria* and seagrass beds) and sequestration of carbon (subtidal sediments, intertidal rock, native oyster, *Sabellaria* and seagrass beds) (Fletcher and others, 2011). ***Environmental resilience:*** The features of the site (native oyster, *Sabellaria* and intertidal rock) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** The features of the site, (infralittoral rock, native oyster, *Sabellaria* and seagrass beds) contribute to local flood and storm protection (Fletcher and others, 2011).	If the conservation objectives of the features are achieved, some features will be maintained in favourable condition and some (subtidal mud, *Sabellaria* reefs, seagrass beds,seapens and burrowing megafauna and Native oysters) recovered to favourable condition. Recovery of the subtidal mud, *Sabellaria,* seagrass beds, seapendss and burrowing megafauna and Native oysters 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. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation	Anticipated direction of change: ⇧ Confidence: Low

It has not been possible to estimate the value derived from regulating services associated with the pMCZ.	from pressures caused by human activities.	

Table 4e. Non-use and option values		**rMCZ 23, Yarmouth to Cowes**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the pMCZ.	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.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ 23 Reference Area 19 Newtown Harbour — Site area (km^2): 1.19

Table 1. Conservation impacts			**rMCZ 23, Reference Area 19 Newtown Harbour**	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) Reference Area lies within rMCZ 23 (Yarmouth to Cowes), on the north-western coast of the Isle of Wight. While this site may not contain the very best examples of features proposed for protection, it is none the less important because it contains a variety of different habitats, species and intertidal broad-scale habitats and is considered to be in very good ecological condition. Old salt workings at Newtown Quay form an important saline lagoon. The rare lagoon sand shrimp *Gammarus insensibilis* has been recorded here in the salt pans. Other features (native oysters, peat and clay exposures, and subtidal chalk) occur just outside the boundaries of the rMCZ Reference Area but within Newtown Harbour and may subsequently be found to occur within the site. Newtown Harbour is considered to be the best example of an undisturbed natural harbour on the south coast. The harbour is also a major wintering ground for wildfowl and waders, with important numbers of Brent geese, the black-tailed godwit, wigeon and teal. The wider rMCZ is an important foraging area for common terns, great cormorants, little terns, Mediterranean gulls and Sandwich terns, to which the rMCZ Reference Area may contribute. This site falls within the Solent Maritime Special Area of Conservation and Newtown Harbour Site of Special Scientific Interest, and is a National Nature Reserve managed by the National Trust. 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**
Broad-scale habitats				
A2.3 Intertidal mud	0.82	-	Unfavourable condition	Recover to favourable condition
A5.4 Subtidal mixed sediments	-	-	Unfavourable condition	Recover to favourable condition
Habitats of Conservation Importance				
Estuarine rocky habitats	34.78 m^2	-	Unfavourable condition	Recover to favourable condition
Species of Conservation Importance				
Lagoon sand shrimp *Gammarus insensibilis*	No data	-	Unfavourable condition	Recover to favourable condition

Site-specific costs arising from the effect of the recommended Marine Conservation Zone (rMCZ) on human activities (over 2012 to 2031 inclusive)

Table 2a. Archaeological heritage	**rMCZ 23, Reference Area 19 Newtown Harbour**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in the costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
A World War II bombing decoy site is recorded within the site. There is evidence of 17th- to 19th-century salt workings (Salterns). Several unidentified obstructions have been reported by fishers in 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 for one licence application could be in the region of £500–£10,000, depending on the size of the rMCZ (English Heritage, pers. comm., 2012). If archaeologists respond to the prohibition of excavation 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. The prohibition of excavation will prevent interpretation of archaeological evidence from the site, thereby decreasing the acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

Table 2b. Commercial fisheries	**rMCZ 23, Reference Area 19 Newtown Harbour**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Closure of the entire site to all gear types.	
Summary of all fisheries: The rMCZ Reference Area lies within an estuary in rMCZ 23 Yarmouth to Cowes and is primarily intertidal, so there is little overlap with commercial fishing interests. It is unknown how many vessels use this rMCZ Reference Area, although it is indicated that some deploy bottom trawls, dredges, pots and traps, nets, hooks and lines fish at low levels (MCZ Fisheries Model, 2011). More detail on the approach used for the fisheries method is provided in Annexes H7 and N9. Estimated annual value of landings from the rMCZ Reference Area: £0.001 million per year (m/yr) (MCZ Fisheries Model). (Due to resolution issues of the MCZ Fisheries Model and the small size of many rMCZ Reference Areas in the Balanced Seas region, the values of some	

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 23, Reference Area 19 Newtown Harbour</th></tr>
<tr><td colspan="2">fisheries' landings may be inaccurate. They have been included as a precautionary measure and to avoid underestimating the economic value of a site.)</td></tr>
<tr><th>Baseline description of UK commercial fisheries</th><th>Costs of impact of rMCZ on UK commercial fisheries</th></tr>
<tr><td>Bottom trawls: It is unknown how many vessels use bottom trawls in the rMCZ Reference Area, but the MCZ Fisheries Model indicates that numbers are very low.

Estimated total value of landings from the rMCZ Reference Area: £140/yr (MCZ Fisheries Model).</td><td>Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £140</td></tr>
<tr><td>Dredges: It is unknown how many vessels use dredges in the rMCZ Reference Area, but the MCZ Fisheries Model indicates that numbers are very low.

Estimated total value of landings from the rMCZ Reference Area: £170/yr (MCZ Fisheries Model).</td><td>Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £170</td></tr>
<tr><td>Pots and traps: It is unknown how many vessels use pots and traps in the rMCZ Reference Area, but the MCZ Fisheries Model indicates that numbers are very low.

Estimated total value of landings from the rMCZ Reference Area: £550/yr (MCZ Fisheries Model).</td><td>Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £550</td></tr>
<tr><td>Nets: It is unknown how many vessels use nets in the rMCZ Reference Area, but the MCZ Fisheries Model indicates that numbers are very low.

Estimated total value of landings from the rMCZ Reference Area: £220/yr (MCZ Fisheries Model).</td><td>Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £220</td></tr>
<tr><td>Hooks and lines: It is unknown how many vessels use hooks and lines in the rMCZ Reference Area, but the MCZ Fisheries Model indicates that numbers are very low.

Estimated total value of landings from the rMCZ Reference Area:</td><td>Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £20</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ 23, Reference Area 19 Newtown Harbour</th></tr>
<tr><td colspan="2">£20/yr (MCZ Fisheries Model).</td><td></td></tr>
<tr><td colspan="2">Total direct impact on UK commercial fisheries</td><td></td></tr>
<tr><td colspan="2">Estimated annual value of landings from the rMCZ Reference Area: £0.001m/yr (MCZ Fisheries Model).</td><td>Estimated annual value of UK vessel landings and gross value added (GVA) affected:
<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.001</td></tr><tr><td>GVA affected</td><td>0.001</td></tr></table></td></tr>
<tr><td colspan="2">Baseline description of non-UK fisheries</td><td>Costs of impact of rMCZ on non-UK commercial fisheries</td></tr>
<tr><td colspan="2"></td><td>None.</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2c. Recreational Anchoring</th><th>rMCZ 23, Reference Area 19 Newtown Harbour</th></tr>
<tr><td colspan="3">Source of costs of the recommended Marine Conservation Zone (rMCZ)
Closure of the entire site (which comprises four separate segments within the harbour) to all recreational anchoring (except in emergency circumstances).</td></tr>
<tr><td>Baseline description of activity</td><td colspan="2">Costs of impact of rMCZ on the sector</td></tr>
<tr><td>The main anchoring areas in Newtown Harbour have been excluded from the rMCZ Reference Area. Although stakeholder interviews indicated that there is a high intensity of anchoring in Newtown Harbour as a whole, this is in areas outside the four components of the rMCZ Reference Area. A total of 23 interviewees (representing 4,290 club members per year, or 21,804 individuals in total (including additional family members)) indicated that they anchor in the harbour more frequently than monthly (Stakmap, 2010). Permanent moorings have been installed in some areas but anchoring in the seabed is popular, especially within Clamerkin Lake, which lies partially within the north-east segment of the site.</td><td colspan="2">The boundaries of this site (which is a 'cluster' of four separate areas) were developed with the National Trust, which manages the area, the Newtown Harbour Master and representatives of the angling and water-sports sectors, to ensure minimum impact on users and local businesses. The main anchoring areas in Newtown Harbour have been excluded from the rMCZ Reference Area and no significant impacts on the anchoring of recreational vessels are expected.</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2d. Recreational sea angling</th><th>rMCZ 23, Reference Area 19 Newtown Harbour</th></tr>
<tr><td colspan="3">Source of costs of the recommended Marine Conservation Zone (rMCZ)

Closure of the entire site to all recreational angling.</td></tr>
<tr><td>Baseline description of activity</td><td colspan="2">Costs of impact of rMCZ on the sector</td></tr>
</table>

Table 2d. Recreational sea angling	**rMCZ 23, Reference Area 19 Newtown Harbour**
The main angling areas in the harbour have been excluded from the rMCZ Reference Area. Sea angling is popular in the harbour, with shore angling taking place along the old sea walls and private boat angling within the bay (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011), but this is mainly in areas outside the four components of the rMCZ Reference Area.	The boundaries for the rMCZ Reference Area were developed with the National Trust, which manages the area, the Newtown Harbour Master and representatives of the angling and water-sports sectors, to ensure minimum impact on users and local businesses. The main angling areas in Newtown Harbour have been excluded from the rMCZ Reference Area and no significant impacts on recreational anglers are expected.

Table 2e: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 23 Reference Area 19 Newtown Harbour**
Oil and gas related activities (including carbon capture and storage) This rMCZ Reference Area overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 27th Seaward Licensing Rounds). However, it is unlikely that any oil and gas (including carbon capture and storage) infrastructure will be proposed in future in this rMCZ Reference Area due to its location and size (DECC, pers. comm., 2012). Impacts of rMCZ Reference Areas 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 Recommended Marine Conservation Zone (rMCZ) (over 2012 to 2031 inclusive)

Table 3. Human activities in the site that are not negatively affected by the MCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 23 Reference Area 19 Newtown Harbour**
Flood and coastal erosion risk management (coastal defence) Recreation (except for the activities listed above in table 2) 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).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ 23, Reference Area 19 Newtown Harbour**	
Baseline	**Beneficial impact**	
Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption. Intertidal mud provides habitat for fish of commercial importance (Fletcher and others, 2011), and the harbour may provide a spawning and nursery area. 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 rMCZ 23 Table 1 for details). There is very little fishing in the rMCZ Reference Area due to its intertidal nature. A description of on-site fishing activity and the value derived from it is set out in Table 2b. It has not been possible to estimate the value of the off-site benefits that derive from any spawning and nursery area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ Reference Area. The costs of this are set out in Table 2b. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Closure of the rMCZ Reference Area to fishing activity will reduce the on-site fishing mortality of species, but as the site is small it is unclear whether this would benefit stocks of mobile commercial finfish species. As no fishing will be permitted within the rMCZ Reference Area, no on-site benefits will be realised.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ 23, Reference Area 19 Newtown Harbour**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption and recreation services. Intertidal mud provides habitat for fish of commercial importance	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to closure of the	Anticipated direction of change: ⇧ Confidence:

Table 4b. Recreation	**rMCZ 23, Reference Area 19 Newtown Harbour**	
(Fletcher and others, 2011) which are also of interest to anglers. 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 rMCZ 23 Table 1 for details). Although Newtown Harbour is an important location for angling, the main angling areas were excluded from the rMCZ Reference Area itself, as described in Table 2c. 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.	rMCZ Reference Area (see Table 4a). As angling will not be permitted within the rMCZ Reference Area, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers outside the rMCZ Reference Area. Such benefits may be insignificant.	Low
Diving: Diving is not known to take place in the site.	N/A	N/A
Wildlife watching: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of recreation and tourism services. This highly productive ecosystem is a very important feeding ground for wading birds that prey on macroinvertebrates as it is a primary feeding ground that is available all year round (Bale and others 2007 in Fletcher and others, 2011). The most important predators on intertidal mudflats are sole (*Solea solea)*, dab (*Limanda limanda*), flounder (*Platichthys flesus)* and plaice (*Pleuronectes platessa)* which feed on polychaetes, young bivalves and siphons. This habitat is used by migrating birds for feeding, in particular brent geese, shelduck, pintail, oystercatcher, ringed plover, grey plover, bar-tailed and black-tailed godwits, curlew, redshank, knot, dunlin and sanderling (Jones, Hiscock and Connor 2000in 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 some are in favourable condition and some are in	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. The recovery of the features to reference condition may improve their functioning as support for fish and bird populations, potentially benefiting wildlife watching within the rMCZ Reference Area. In addition, an improvement in the condition of site features and any associated increase in abundance and diversity of species that are visible to wildlife watchers may improve the quality of wildlife watching at the site and therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ 23, Reference Area 19 Newtown Harbour**	
unfavourable condition (see rMCZ 23 Table 1 for details). Given the good bird life in the harbour, bird watching is a popular activity and there are hides and nature trails (Natural England Newtown National Nature Reserve website). It has not been possible to estimate the value derived from wildlife watching in the site.	Designating the rMCZ Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.	
Other recreation: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of recreation and tourism services. Newtown Harbour is a very popular location for a range of recreational activities associated with the National Nature Reserve, including boating, swimming and walking (Natural England Newtown National Nature Reserve website). Between 10 and 20 people walk their dogs along the edge of the rMCZ Reference Area every day (Natural England Reference Area questionnaire with National Trust, December 2011). It has not been possible to estimate the value derived from other recreation in the rMCZ Reference Area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. The rMCZ Reference Area is fully contained within rMCZ 2 for which the benefits of other recreation have been assessed. It is not possible to identify whether the Reference Area will have additional benefits over and above this but this seems unlikely. Designating the rMCZ Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.	Anticipated direction of change: ⇧ Confidence: Low

Table 4c. Research and education	**rMCZ 23, Reference Area 19 Newtown Harbour**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. A variety of research activities and monitoring are undertaken as part of management of the National Nature Reserve. It has not been possible to estimate the value derived from research	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High

Table 4c. Research and education	**rMCZ 23, Reference Area 19 Newtown Harbour**	
activities associated with the rMCZ Reference Area.		
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of education services. The Medina Valley Centre carries out field studies in the rMCZ Reference Area about twice a year in collaboration with the National Trust (Natural England Reference Area questionnaire with National Trust, December 2011). There is a visitor centre with educational materials (Natural England Newtown National Nature Reserve website). It has not been possible to estimate the value derived from education activities associated with the rMCZ Reference Area.	MCZ Reference Area designation may provide an opportunity to expand the focus of education events into the marine environment. Designation may aid the development of additional local (to the rMCZ Reference Area) education activities (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ Reference Area contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services	**rMCZ 23, Reference Area 19 Newtown Harbour**	
Baseline	**Beneficial impact**	
Regulation of pollution: Intertidal mud contributes to the bioremediation of waste (Fletcher and others, 2011). ***Environmental resilience:*** N/A ***Natural hazard protection:*** Intertidal mud contributes to local flood and storm protection (Fletcher and others, 2011). It has not been possible to estimate the value derived from regulating services associated with the rMCZ Reference Area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of intertidal mud and closure to fishing could increase the site's benthic biodiversity and biomass, improving the regulating capacity of its habitats. Designating the recommended Marine Conservation Zone Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ 23, Reference Area 19 Newtown Harbour**

Table 4e. Non-use and option values	**rMCZ 23, Reference Area 19 Newtown Harbour**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) Reference Area and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of its 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 Reference Area 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.	Anticipated direction of change: Confidence: Moderate

rMCZ 24.2 Fareham Creek

Site area (km^2): 3.58

Table 1. Conservation impacts				rMCZ 24.2, Fareham Creek
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) would protect an area rich in native oysters and sheltered muddy gravels. The site covers Fareham Creek, the north-westernmost tributary into Portsmouth Harbour. The banks of the estuary at Fareham are the only parts of Portsmouth Harbour that are undeveloped and thus retain their natural setting of wooded banks and grassland. Tagged grey seals frequent Portsmouth Harbour on a regular basis and so may occur here. This site is completely contained within the Portsmouth Harbour Site of Special Scientific Interest, Special Protection Area and Ramsar site. 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**
Habitats of conservation importance				
Native Oyster beds	-	N/A	Favourable condition	Maintain at favourable condition
Sheltered muddy gravels	-	1 record	Favourable condition	Maintain at favourable condition
Species of conservation importance				
Native oyster (*Ostrea edulis*)	-	5 records	Favourable condition	Maintain at favourable condition

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 24.2, Fareham Creek
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Mesolithic, palaeolithic and bronze-age artefacts have been recorded within the site (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

Table 2a. Archaeological heritage	rMCZ 24.2, Fareham Creek
	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). No further impacts on activities related to archaeology are anticipated.

Table 2b. National defence	rMCZ 24.2, Fareham Creek
Source of costs of the recommended Marine Conservation Zone (rMCZ)	
Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
MOD is known to make use of the site. Activities include sea bed sampling and machine gun firing.	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 2c. Ports, harbours, shipping and disposal sites	rMCZ 24.2, Fareham Creek		
Source of costs of the recommended Marine Conservation Zone (rMCZ)			
Management scenario 1: 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 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. ***Management scenario 2:*** 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 to update the Maintenance Dredging Protocol (MDP) being prepared by Portsmouth Port in order to assess impacts of activities on MCZ features. 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**		
Disposal sites: There are two sites (WI065 Basin 1 Naval Base	*£m/yr*	Scenario 1	Scenario 2

Table 2c. Ports, harbours, shipping and disposal sites	rMCZ 24.2, Fareham Creek

Portsmouth and WI064 Portsmouth Ballast) within 5km of the rMCZ which are licensed for disposal of channel dredge material. The average number of licence applications received for all of these disposal sites in total is 0.3 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011).

Navigational dredge areas: Maintenance dredging is licensed within 1km of the rMCZ. The main channel leading up to Bedenham Pier is used by ammunition barges for MOD, and has a maintained depth of 5 metres. The channel is surveyed annually and dredged if necessary every 2 or 3 years by the Queen's Harbour Master Portsmouth. 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.

Maintenance dredging is licensed within 5km of the rMCZ. The main channel leading up to Bedenham Pier is used by ammunition barges for MOD, and has a maintained depth of 5 metres. The channel is surveyed annually and dredged if necessary every 2 or 3 years by the Queen's Harbour Master Portsmouth. 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 area is covered by an MDP, it is assumed that the assessment of environmental impact is not changed over the 20 year period of the IA.

Port development: There is one port within 5km of the rMCZ which may undergo development in the future: Portsmouth. No port developments are known to be planned within the 20 year period of the Impact Assessment (IA).

Cost to the operator	0.002	0.005*

* 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 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.

Scenario 1: 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 costs by activity by site is provided in Annex N11).

Scenario 2: Future licence applications for disposal of material, navigational dredging and port or harbour 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 costs by activity by site is provided in Annex N11).
Also, additional costs will be incurred in updating the Maintenance Dredging Protocol (MDP) being prepared for Portsmouth Port as this will need to consider the potential effects of activities on the features protected by the rMCZ. The anticipated additional cost for MDPs is estimated to be a one-off cost of £8438..

Table 2d: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 24.2, Fareham Creek**
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 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)

Table 3. Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 24.2 Fareham Creek**
Cables (existing interconnectors and telecom cables) Commercial fisheries (mid-water trawls) 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).

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 4a. Fish and shellfish for human consumption		**rMCZ 24.2, Fareham Creek**
Baseline	**Beneficial impact**	
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. Sheltered muddy gravels support commercially targeted fish and shellfish. Native oyster reef supports the production of commercial fish and large mobile crustaceans for the functional lifetime of the reef (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). Although previously fished for native oysters, there is a byelaw prohibiting dredging in order to protect the seagrass beds and so there is currently no oyster fishing.	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. However, maintaining and monitoring the current fishing practices will safeguard the population of commercial fish and ensure no increase in fishing activity occurs or alternative gears are used. 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. 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.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ 24.2, Fareham Creek**
Baseline	**Beneficial impact**	
Angling: 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. The sheltered muddy gravels found within this rMCZ support high biodiversity 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	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition 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.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ 24.2, Fareham Creek**
favourable condition (see Table 1 for details). The rMCZ is a popular area for local shore anglers particularly at low tide (World Fishing Forum). Due to the complex habitats within the site, it provides suitable habitat for many commercial fish species, which are fished recreationally and is likely to help support potential on-site and off-site angling. 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 rMCZ.	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.	
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: 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). The sheltered muddy gravels within the rMCZ contribute to an area of high biodiversity which in turn may support foraging areas for sea birds, particularly waders such as oyster catcher and redshank. The rMCZ is a popular area for bird watching (www.hants.gov.uk/rh/walking/feat.pdf). It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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. 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, 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.	Anticipated direction of change: ⟺ Confidence: Moderate
Other recreation: 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 rMCZ is used for sailing (www.sailingnetworks.com/organisation/view/286) and coastal walking (www.hants.gov.uk/rh/	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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.	Anticipated direction of change: ⟺

Table 4b. Recreation		**rMCZ 24.2, Fareham Creek**
walking/feat.pdf). It has not been possible to estimate the value derived from tourism in the rMCZ.	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.	Confidence: Moderate

Table 4c. Research and education		**rMCZ 24.2, Fareham Creek**
Baseline	**Beneficial impact**	
Research: 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. Hampshire and Isle of Wight Wildlife Trust may undertake research in this rMCZ, as may local universities and other institutions. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. Hampshire and Isle of Wight Wildlife Trust may provide educational activities in this rMCZ (Hampshire and Isle of Wight Wildlife Trust website). It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events into the marine environment. 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. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services		**rMCZ 24.2, Fareham Creek**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site (native oysters and sheltered muddy gravels) contribute to the sequestration of carbon. (Fletcher and others, 2011)	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition.	Anticipated direction of change:

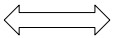
Table 4d. Regulating services		**rMCZ 24.2, Fareham Creek**
Environmental resilience: The features of the site (native oysters and sheltered muddy gravels) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** The features of the site (native oysters) contribute to local flood and storm protection (Fletcher and others, 2011). It has not been possible to estimate the value derived from regulating services associated with the pMCZ.	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.	 Confidence: Moderate

Table 4e. Non-use and option values		**rMCZ 24.2, Fareham Creek**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the pMCZ.	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. Examples of these values are shown in (Ranger, Lowe, Sanghera, & 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 'outstanding scenery.' A feeling of emotional attachment to the site was highlighted as important	Anticipated direction of change:  Confidence: Moderate

	as well. Regarding non-extractive use value, ease of access and close proximity for recreational users were considered important as reasons to protect this site. Source: Ranger and others. (2011)	

rMCZ 25.1 Pagham Harbour

Site area (km^2): 2.70

Table 1. Conservation impacts			**rMCZ 25.1, Pagham Harbour**	
1a. Ecological description				
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 foundin 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. Source: Balanced Seas Final Recommendations (2011) and Balanced Seas Final Recommendations Amendment Report (December 2011).				
1b. Baseline condition of MCZ features and impact of the MCZ				
Feature	**Area of feature (km2)**	**No. of occurrences**	**Baseline**	**Impact**
Habitats of conservation importance				
Seagrass	0.03	-	Favourable condition	Maintain at favourable condition
Species of conservation importance				
Defolin's Lagoon Snail (*Caecum armoricum*)	-	1 record	Favourable condition	Maintain at favourable condition
Lagoon Sand Shrimp (*Gammarus insensibilis*)	-	3 records	Favourable condition	Maintain at favourable condition
European Eel (*Anguilla anguilla*)	N/A	-	Favourable condition	Maintain at favourable condition

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 25.1, Pagham Harbour**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
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.

Table 2b: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 25.1, Pagham Harbour**
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 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)

Table 3. Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 25.1 Pagham Harbour**
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).

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 4a. Fish and shellfish for human consumption	**rMCZ 25.1, Pagham Harbour**	
Baseline	**Beneficial impact**	
No commercial fishing is known to take place in the recommended Marine Conservation Zone.	N/A	

Table 4b. Recreation	**rMCZ 25.1, Pagham Harbour**	
Baseline	**Beneficial impact**	
Angling: 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. 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).	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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 -	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ 25.1, Pagham Harbour**
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. 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.		
Diving: Diving does not take place in the rMCZ.	N/A	N/A
Wildlife watching: 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). 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 (RSPB website). The rMCZ is a popular area for bird watching, as the site overlaps with the Pagham RSPB reserve (RSPB website). It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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.	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4b. Recreation		**rMCZ 25.1, Pagham Harbour**
Other recreation: 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 rMCZ is a popular recreational area for visitors and residents for sailing (http://paghamyachtclub.com/sailing/), wildfowling and coastal walking. It has not been possible to estimate the value derived from other recreational activities in the rMCZ.	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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. 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.	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4c. Research and education		**rMCZ 25.1, Pagham Harbour**
Baseline	**Beneficial impact**	
Research: 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. 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 (Reserve Manager's Report, 2010). It has not been possible to estimate the value derived from research activities associated with the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services.	MCZ designation may provide an opportunity to expand the focus of education events into the marine environment. Designation may aid the development of additional local (to the	Anticipated direction of change: ⇧

Table 4c. Research and education	**rMCZ 25.1, Pagham Harbour**	
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 (Reserve Manager's Report, 2010). There is a purpose built education centre next to the visitor centre accommodating more than 30 pupils and the reserve organises national curriculum tailored classes and fieldwork (RSPB website) It has not been possible to estimate the value derived from education activities associated with the rMCZ.	rMCZ) education activities (e.g. events, interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Confidence: Moderate

Table 4d. Regulating services	**rMCZ 25.1, Pagham Harbour**	
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site (seagrass beds) contribute to water purification and the sequestration of carbon (Fletcher and others, 2011). ***Environmental resilience:*** The features of the site are not known to contribute to resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** The features of the site (seagrass beds) contribute to local flood and storm protection through erosion control (Fletcher and others, 2011). It has not been possible to estimate the value derived from regulating services associated with the pMCZ.	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4e. Non-use and option values	**rMCZ 25.1, Pagham Harbour**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to	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

⇧

benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the pMCZ.	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. Examples of these values are shown in (Ranger, Lowe, Sanghera, & 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'. Source: Ranger and others. (2011)	change: Confidence: Moderate

rMCZ 25.1 Reference Area 11 Church Norton Spit — Site area (km^2): 0.03

Table 1. Conservation impacts	rMCZ 25.1, Reference Area 11 Church Norton Spit
1a. Ecological description	
This recommended Marine Conservation Zone (rMCZ) Reference Area lies within rMCZ 25.1 (Pagham Harbour) and is of very high importance for the rare Defolin's lagoon snail *Caecum armoricum* as it is one of only two locations where this species has been recorded within the Balanced Seas Project Area. Previously known in the UK only from a single record on the Fleet in Dorset, this species was found in 2007 in the upper shore shingle on Church Norton Spit, above mean high water. The rMCZ Reference Area covers part of the shingle spit only, from mean high water on the harbour side to mean high water on the seaward side (no subtidal water is included). The wider rMCZ supports ideal conditions for breeding common and little terns and other shore birds, and has roosting sites for waders on the shingle coastline, to which this site may contribute. The rMCZ Reference Area lies within Pagham Harbour Local Nature Reserve which and is also a Site of Special Scientific Interest, a site protected under the Ramsar Convention and a Special Protection Area. The entire spit is fenced off from April to July (or August depending on the status of the ground-nesting birds) and the rMCZ Reference Area lies entirely within this existing seasonal closed area. Source: Balanced Seas Final Recommendations (2011) and Balanced Seas Final Final Recommendations Amendments Report (2011).	

1b. Baseline condition of MCZ features and impact of the MCZ

Feature	Area of feature (km2)	No. of occurrences	Baseline	impact
Species of Conservation Importance				
Defolin's Lagoon Snail *Caecum armoricum*	-	1 record	Unfavourable condition	Recover to favourable condition

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

Table 2a. Recreational angling	rMCZ 25.1, Reference Area 11 Church Norton Spit
Source of costs of the recommended Marine Conservation Zone (rMCZ) Closure of entire site to all recreational angling.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
It is understood that anglers cast their lines only below mean high water and so will not be fishing in the rMCZ Reference Area, which covers only intertidal areas. Shore angling takes place on the harbour side of the rMCZ Reference Area through a permit scheme (25 permits are issued by the local	It is not anticipated that the Reference Area will impact on where anglers cast their lines. If it transpires that the activities of anglers on the shore, such as pushing rod holders into the surface of the shingle spit and erecting shelters are impacting on the site's features, mitigation may be required. Given the low level of use of the shore by anglers, it is not anticipated that this would have a significant impact.

Table 2a. Recreational angling	**rMCZ 25.1, Reference Area 11 Church Norton Spit**
nature reserve). Generally only one shore angler fishes from the shore at a time, for approximately an hour a day from September to March during mid-tide when water is entering the harbour (T. Osborne, email, 12th July 2011). There is no access to Church Norton Spit within the rMCZ Reference Area from 1 April to 31 July as it is part of the area closed seasonally to protect breeding terns and other birds. On the seaward side, larger numbers of shore anglers use the area, particularly in September and October, and slightly longer if the early autumn is warm and fish (bass and mullet) linger in the harbour. Rod holders or shelters are pushed down into the shingle for stability (T. Osborne, email, 12th July 2011; Natural England Stakeholder Interview for rMCZ Reference Area 11Church Norton Spit, November 2011).	

Table 2b. Recreation – Walking (including dog walking)	**rMCZ 25.1, Reference area 11 Church Norton Spit**
Source of costs of the recommended Marine Conservation Zone (rMCZ) ***Management scenario 1 (uniform management):*** People walking through the rMCZ will be encouraged to use marked routes; dog walkers will be required to dispose of dog faeces in provided facilities.	
Baseline description of activity	**Costs of impact of MCZ on the sector**
Significant numbers of people enjoy walking along the spit throughout the year but they tend to follow the tracks as softer single areas (where Defolins Lagoon Snail occurs) are hard to walk in. It is therefore anticipated that walkers will have a neglible impact on the site's features. Dog walking takes place along the spit at a very low level on a small strip of the Reference Area on the landward side (Natural England Stakeholder Interview for rMCZ Reference Area 11Church Norton Spit, November 2011).	Given that walking would still be allowed in the site, that some regulations are already in place and that walkers prefer not to walk on shingle which is where Defolins Lagoon Snail occurs, impacts are likely to be negligible. If the rMCZ Reference Area is designated, visitors would be encouraged to use existing marked routes to avoid adverse effects, and dog walkers would be required to remove and dispose of dog faeces in provided facilities. Costs of the site would include the cost of notifying visitors of the need to stay on to designated paths if walkers were found to impact on the site's features and such notification is not in place already. Also costs of notifying people of

Table 2b. Recreation – Walking (including dog walking)	rMCZ 25.1, Reference area 11 Church Norton Spit
There is no Dog Control Order in place but there is a Dog on Lead byelaw which only allows dogs off leads between mean low water and mean high water. If dog fouling occurs this can be prosecuted through the District Council through a fixed penalty. The top of the spit ridge within the rMCZ Reference Area is closed to the public during the summer months to protect the breeding colony of terns as per SPA regulations (Natural England Stakeholder Interview for rMCZ Reference Area 11Church Norton Spit, November 2011).	the need to remove dog faeces and the location of the nearest disposal facility if this is found to impact on the site's features, though adequate control should be provided if the existing management of dog fouling is effective. These costs are included in the costs of managing the site.

Table 2c: Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ 25.1 Reference Area 11 Church Norton Spit
Oil and gas related activities (including carbon capture and storage)	
This rMCZ Reference Area overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 27th Seaward Licensing Rounds). However, it is unlikely that any oil and gas (including carbon capture and storage) infrastructure will be proposed in future in this rMCZ Reference Area due to its location and size (DECC, pers. comm., 2012). Impacts of rMCZ Reference Areas 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)

Table 3. Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) (existing activities at their current levels and future proposals known to the regional MCZ projects)	rMCZ 25.1 Reference Area 11 Church Norton Spit
Recreation (except for the activities listed above in table 2) 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).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ 25.1, Reference Area 11 Church Norton Spit**	
Baseline	**Beneficial impact**	
There are no features to be protected by the recommended Marine Conservation Zone that contribute to the delivery of fish and shellfish for human consumption, and no fishing activities take place within the site.	N/A	N/A

Table 4b. Recreation	**rMCZ 25.1, Reference Area 11 Church Norton Spit**	
Baseline	**Beneficial impact**	
Angling: There is a small amount of shore angling adjacent to this recommended Marine Conservation Zone (rMCZ) Reference Area as described in Table 2a. The anglers stand within the rMCZ Reference Area but the majority of lines are cast outside the site.	N/A	N/A
Diving: Diving is not known to take place in the site.	N/A	N/A
Wildlife watching: As part of an existing nature reserve, this rMCZ Reference Area is a very important site for wildlife watching with regular visitors who come particularly for bird watching (Natural England Reference Area questionnaire, November 2011). It has not been possible to estimate the value derived from wildlife watching in the rMCZ Reference Area.	If the conservation objectives of the feature are achieved, the feature will be recovered to reference condition. However, the Defolin's lagoon snail, given its microscopic size, will not itself contribute to benefits from wildlife watching.	N/A

Table 4b. Recreation	**rMCZ 25.1, Reference Area 11 Church Norton Spit**	
Other recreation: The rMCZ Reference Area is popular for a range of recreational activities associated with the existing nature reserve, particularly walking (a byelaw requires dogs to be kept on leads) (Natural England Reference Area questionnaire, November 2011). It has not been possible to estimate the value derived from other recreation in the rMCZ Reference Area.	If the conservation objectives of the feature are achieved, the feature will be recovered to reference condition. The rMCZ Reference Area is fully contained within rMCZ 2 for which the benefits of other recreation have been assessed. It is not possible to identify whether the Reference Area will have additional benefits over and above this but this seems unlikely. Designating the rMCZ Reference Area will protect its feature and the ecosystem services that it provides against the risk of future degradation from pressures caused by human activities (because, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇧ Confidence: Low

Table 4c. Research and education	**rMCZ 25.1, Reference Area 11 Church Norton Spit**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the feature to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. A range of monitoring and research activities are undertaken as part of the management of the nature reserve (Natural England Reference Area questionnaire, November 2011). It has not been possible to estimate the value derived from research activities associated with the rMCZ Reference Area.	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the feature to be protected by the rMCZ Reference Area can contribute to the delivery of education services. A number of educational activities are carried out by the nature reserve management, involving both adults and children (Natural England	MCZ Reference Area designation may provide an opportunity to expand the focus of education events into the marine environment. Designation may aid the development of additional local (to the rMCZ Reference Area) education activities (e.g. events and	Anticipated direction of change: ⇧ Confidence:

Table 4c. Research and education	**rMCZ 25.1, Reference Area 11 Church Norton Spit**	
Reference Area questionnaire, November 2011). It has not been possible to estimate the value derived from education activities associated with the rMCZ Reference Area.	interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ Reference Area contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Moderate

Table 4d. Regulating services	**rMCZ 25.1, Reference Area 11 Church Norton Spit**	
Baseline	**Beneficial impact**	
Regulation of pollution: N/A	N/A	N/A
Environmental resilience: N/A	N/A	N/A
Natural hazard protection: N/A	N/A	N/A

Table 4e. Non-use and option values	**rMCZ 25.1, Reference Area 11 Church Norton Spit**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) Reference Area and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of its feature 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 Reference Area will protect the feature and the ecosystem services provided, and thereby the option to benefit from these services in the future, from the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ 25.2 Selsey Bill and the Hounds

Site area (km^2): 12.90

Table 1. Conservation impacts			**rMCZ 25.2, Selsey Bills and the Hounds**	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) would protect the unusual outcrops of limestone and clay exposures (the Hounds, the Malt Owers, the Streets, the Grounds and the Mixon) and a section of the geological feature, Bracklesham Bay. This site is well known for its high biodiversity, created by the unusual sea bed topography and indicated by the benthic biotope richness data. In the south-east of the site is the Mixon Hole, a dramatic 20 metre drop in the sea floor exposing clay cliffs capped with limestone which support a rich diversity of habitats and species. The Hounds, lying to the west of Selsey Bill, is a reef formed of limestone cap-rock, with an underlying softer clay layer eroded in places to form holes and caves. The bedrock outcrops are sparsely colonised by an assortment of algal species, such as kelp and red foliose algae, and sessile species, such as anemones and sponges. The reef is considered important, as sublittoral rocky reefs account for less than 3% of the total Sussex sea bed (within 12nm) and exposed limestone strata are also rare. The Mixon Hole contains the most important examples of peat and clay exposures in the region. Selsey Bill and the Hounds is a crucial foraging area for common tern, little tern and Sandwich tern in the spring, and for nearby breeding birds in the summer. The Hounds and the Streets are important haul-out sites for seals. In addition, the important south-east features of hard rock reefs and Ross coral *Pentapora foliacea* also occur here. The site overlaps with Bracklesham Bay Site of Special Scientific Interest, designated for its geological interest. The Hounds and Mixon Hole were identified as marine Sites of Nature Conservation Importance (mSNCIs)[1] in 2001 by West and East Sussex County Councils. 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**
Broad-scale habitats				
A3.1 High energy infralittoral rock	2.33	-	Favourable condition	Maintain at favourable condition
A5.2 Subtidal sand	4.98	-	Favourable condition	Maintain at favourable condition
A5.4 Subtidal mixed sediments	4.79		Favourable condition	Maintain at favourable condition
Habitats of conservation importance				
Peat and clay exposures	7,394 m^2	-	Favourable condition	Maintain at favourable condition
Species of conservation importance				
Short-snouted seahorse (*Hippocampus hippocampus*)	-	No records	Favourable condition	Maintain at favourable condition

[1] Marine SNCIs are non-statutory sites identified on account of their special interest with regard to habitat, wildlife, geology or geomorphology by East and West Sussex County Councils.

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 25.2, Selsey Bill and the Hounds**
Source of costs of the recommended Marine Conservation Zone (rMCZ)	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed. However, restrictions could be placed on archaeological excavation in areas of peat and clay exposures in the site.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Objects of all periods from the Palaeolithic to the Roman period have been recovered from the foreshore along the eroding coastline and objects and sites have been spotted further out away from the coast (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. If archaeologists respond to restrictions on excavation in areas of peat and clay exposures 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.

Table 2b. Renewable energy – tidal energy	**rMCZ 25.2, Selsey Bill and the Hounds**
Source of costs of the recommended Marine Conservation Zone (rMCZ)	
Management scenario 1: Increase in costs of assessing environmental impacts for licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline).	

Table 2b. Renewable energy – tidal energy **rMCZ 25.2, Selsey Bill and the Hounds**

Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and provision of additional mitigation of impacts of cable protection (relative to the mitigation provided in the baseline).

Baseline description of activity	Costs of impact of rMCZ on the sector
There is potential for future developments that generate electricity using the tidal energy resource in this rMCZ. The rMCZ overlaps with the East of Isle of Wight Area of Potential, for which there is anticipated energy generation potential of 100MW (Department of Energy and Climate Change, pers. comm., 2011). It is assumed for the purpose of the Impact Assessment (IA) that there would be one licence application within the timeframe of the IA. However, it is unlikely, though still possible, that deployment of tidal energy technology will take place in the rMCZ during the 20 year period covered by the IA.	The estimated cost to tidal energy developers of the rMCZ is expected to fall within the following range of scenarios: *£m* / Scenario 1 / Scenario 2 Cost / 0.001 / 0.001 For Scenario 1, If the rMCZ is designated, one licence application for the tidal energy installations could be required to consider the potential effects of the construction and operational activities on the features protected by the rMCZ and the potential to achieve the MCZ conservation objectives. This is expected to result in one-off costs of £0.011m in 2015 (based on, per broad-scale habitat assessed, 6 days of a consultant's time at £700/day + 1 day for legal review at £800/day) with a present value cost of £0.009m. For Scenario 2, the costs would be the same as for Scenario 1 plus the additional costs of mitigating the impacts of cable protection. As the proposed cable routes are unknown, it is unclear whether routes for any inter-array or export cables will be sought that pass through the rMCZ, and if they are what length of cable protection may be required. If alternative cable protection is required to mitigate impacts, this is estimated to cost £1m/km. However, both Natural and JNCC have said that this additional requirement is unlikely to be needed and so this additional cost is anticipated to be unlikely (Natural England and JNCC, pers. comm., 2012).

Table 2c: Other impacts that are assessed for the suite of MCZs and not for this site alone **rMCZ 25.2, Selsey Bill and the Hounds**

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 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)

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 25.2, Selsey Bill and the Hounds**
Commercial fisheries (bottom trawls, collection by hand, dredges, hooks and lines, mid-water trawls, nets, pots and traps) Flood and coastal erosion risk management activities - current plans (based on advice provided by Natural England (pers. comm., 26.6.12) that mitigation is not needed for impacts that arise as a result of natural processes associated with managed realignment), 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).

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 4a. Fish and shellfish for human consumption	**rMCZ 25.2, Selsey Bill and the Hounds**	
Baseline	**Beneficial impact**	
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.	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)	Anticipated direction of change: ⇔

Subtidal sand and subtidal mixed sediments are important spawning and nursery grounds for juvenile commercial species such as flatfishes and bass. Infralittoral rock is suitable habitat for inshore commercial fisheries species, particularly lobster and crab (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). The rMCZ is one of the most important potting grounds on the south coast and also has a high level of netting.. The total value of landings derived from commercial fisheries within this site is £0.059m/yr (MCZ Fisheries Model). It has not been possible to estimate the value of the off-site benefits which derives from the spawning and nursery area.	of fishing activities is expected. However, maintaining and monitoring the current fishing practices will safeguard the population of commercial fish and ensure no increase in fishing activity occurs or alternative gears are used. 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. 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.	Confidence: Moderate

Table 4b. Recreation	**rMCZ 25.2, Selsey Bill and the Hounds**	
Baseline	**Beneficial impact**	
Angling: 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. The infralittoral rock and subtidal sand found within this rMCZ support high biodiversity and are important spawning and nursery grounds for commercially important fish species 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).	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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 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	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ 25.2, Selsey Bill and the Hounds**
The rMCZ is a popular area for both shore and boat angling including charter vessels. The reef features such as The Hounds, The Streets and Mixon Hole are particularly popular boat fishing spots as well as Selsey Bill itself. Shore anglers will frequent anywhere with good access and hotspots include both the west and east beach either side of Selsey Bill (Total fishing website). Due to the complex habitats within the site, it provides suitable habitat for many commercial fish species, which is likely to help support potential on-site and off-site fisheries. 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 estuary spawning and nursery area.	than an overall increase in angling.	
Diving: 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 rMCZ is used for diving and the Mixon Hole is a particularly popular dive site (Mulberry Divers website). It has not been possible to estimate the value derived from diving in the rMCZ.	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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 stalked jellyfish increase, this could lead to an improved quality of experience for divers. The designation may lead to an increase in diving 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 diving trips at the national scale.	Anticipated direction of change: ⟺ Confidence: Moderate
Wildlife watching: 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 infralittoral rock and subtidal sands found within this rMCZ contribute to an area of high biodiversity, which in turn may support foraging areas for sea birds, particularly common tern, little tern and	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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. If the rMCZ is designated this will provide an additional positive aspect about	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4b. Recreation		**rMCZ 25.2, Selsey Bill and the Hounds**
Sandwich tern. The high biodiversity of the site also supports important haul-out sites for seals (Balanced Seas Final Report Recommendations, 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). The rMCZ is a popular area for wildlife watching, particularly bird watching in Bracklesham Bay (RSPB Website). It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	the location that could be promoted by the tourism and leisure industry and that would be expected to increase visitation rates.	
Other recreation: 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 rMCZ is a popular recreational seaside destination, with a variety of facilities, camping sites and coastal paths available for visitors (West Sussex Info Website). It has not been possible to estimate the value derived from recreation and tourism services in the rMCZ.	If the conservation objectives of the features are achieved, all features will be maintained in favourable condition. 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. 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.	Anticipated direction of change: ⟺ Confidence: Moderate

Table 4c. Research and education		**rMCZ 25.2, Selsey Bills and the Hounds**
Baseline	**Beneficial impact**	
Research: 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. Considerable research has been done on the geology of the seabed within this rMCZ and the movement of sediment due to coastal erosion (Southern Coastal Group Website). Sussex Wildlife Trust collect	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.	Anticipated direction of change: ⇧ Confidence: High

Table 4c. Research and education		**rMCZ 25.2, Selsey Bills and the Hounds**
information through their Seasearch and Shoresearch initiatives and work in close partnership with Sussex Inshore Fisheries and Conservation Authority on various projects including a habitat mapping project in coastal waters (Sussex Wildlife Trust Website). It has not been possible to estimate the value derived from research activities associated with the rMCZ.		
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. Sussex Wildlife Trust provide outreach into schools relating to the marine environment as well as adult learning courses out in the field (Sussex Wildife Trust Website), but it is not known whether any of these activities relate to the rMCZ. It has not been possible to estimate the value derived from education activities associated with the rMCZ.	MCZ designation may provide an opportunity to expand the focus of education events into the marine environment. 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. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services		**rMCZ 25.2, Selsey Bill and The Hounds**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to bioremediation of waste (subtidal sediments) and the sequestration of carbon (subtidal sediments) (Fletcher and others, 2011). ***Environmental resilience:*** The features of the site are not known to contribute to resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** The features of the site, (infralittoral rock) contribute to local flood and storm protection (Fletcher and others, 2011).	If the conservation objectives of the features are achieved, the features will be maintained in favourable condition. No change in feature condition and management of human activities is expected and therefore no benefit to the regulation of pollution is expected. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.	Anticipated direction of change: ⇔ Confidence: Moderate

Table 4d. Regulating services	**rMCZ 25.2, Selsey Bill and The Hounds**	
It has not been possible to estimate the value derived from regulating services associated with the rMCZ.		

Table 4e. Non-use and option values	**rMCZ 25.2, Selsey Bills and the Hounds**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an ecologically coherent network of 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. Examples of these values are shown in (Ranger, Lowe, Sanghera, & 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 that the 'site has been identified as an important site many years ago under the mSNCI scheme which was pioneered in Sussex.' Regarding non-extractive use value, recreational users particularly divers felt that 'there's nowhere else like it' and considered the importance to recreational use as an important reason to protect this site.	Anticipated direction of change: ⇧ Confidence: Moderate

	Furthermore, allowing species recovery, particularly fish and shellfish, was perceived as an important management reason to protect the site and the area is considered an important nursery area for 'lots of important fisheries species, like lobster, edible crab and young cuttlefish, as well as supporting a healthy population of UK shark species'. Source: Ranger and others. (2011)	

rMCZ 25.2 Reference Area 12 Mixon Hole — Site area (km^2): 0.23

Table 1. Conservation impacts			rMCZ 25.2, Reference Area 12 Mixon Hole	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) Reference Area lies within rMCZ 25.2 (Selsey Bill and the Hounds) and comprises the clay cliff forming the north face of the Mixon Hole. This is a very unusual feature and is one of the best examples of the peat and clay exposures habitat Feature of Conservation Importance in the Balanced Seas Project Area. The clay cliff extends 30 metres down and supports an array of flora and fauna including burrowing piddocks, the evidence for which can be seen in the numerous holes. This feature is unique within both the Balanced Seas Project Area and the UK. The area has been noted by Plantlife and Natural History Museum surveys as containing unusual plant assemblages and a rare combination of species found only on top of the Mixon Hole. The Mixon Hole is a Marine Site of Nature Conservation Importance. 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**
Broad-scale habitats				
A5.4 Subtidal mixed sediments	-	-	Unfavourable condition	Recover to favourable condition
Habitats of Conservation Importance				
Peat and clay exposures	0.23	-	Unfavourable condition	Recover to favourable condition

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

Table 2a. Archaeological heritage	rMCZ 25.2, Reference Area 12 Mixon Hole
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
An unidentified sea bed feature is recorded. A feature identified as a 'marine quarry' is located 200 metres north of this site and a wreck identified as the *Prosperous* (grounded on Mixon Rocks, 1833) (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 in one

Table 2a. Archaeological heritage	**rMCZ 25.2, Reference Area 12 Mixon Hole**
	licence application could be in the region of £500 to £10,000 depending 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 Impact Assessment. The prohibition of excavation and therefore interpretation of archaeological evidence from the site will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

Table 2b. Recreational angling	**rMCZ 25.2, Reference Area 12 Mixon Hole**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Closure of the entire site to all recreational angling.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Ten Stakmap interviews (7 charter boat fishing, 3 boat angling) indicated that their areas of activity overlap with the rMCZ Reference Area. For the boat anglers (representing 3 local clubs and 69 people/yr), the extent of the overlap of the rMCZ Reference Area with the areas where they fish may be substantial. The charter boat operators who were interviewed represent 3,950 anglers/yr. According to local sea anglers, from May to September on most weekends (Friday, Saturday and Sunday) an average of 6 to 8 boats, and sometimes as many as 12, fish Mixon Hole throughout the day. Each boat carries 1–3 anglers on average, although larger boats carry 6–10 anglers (Selsey Boat Angling Club via Manhood Peninsula Steering Group, email, 28th December 2011).	It is anticipated that some anglers would respond to the closure by fishing in alternative areas adjacent to the site. However, because of the high level of use of the site by recreational anglers, a large number of anglers and charter boat operators are likely to be affected. If anglers respond to the closure by fishing in alternative areas that are more distant this could impact on local businesses that provide services to anglers.

Table 2c. Recreational diving	**rMCZ 25.1, Reference area 12 Mixon Hole**
Source of costs of the MCZ ***Management scenario 1:*** Installation of a permanent fixing for a shot line to reduce damage from the activities of recreational divers.	
Baseline description of activity	**Costs of impact of MCZ on the sector**
Numerous divers and dive clubs use the Mixon Hole, though estimated numbers are not available (Natural England Stakeholder Interview for rMCZ Reference Area 12 Mixon Hole, November 2011; Stakmap, 2010). Diving in the site is highly dependent on the weather and time of slack tide (which is the only time that divers can visit this location because of the strong currents). In general, only responsible divers dive the Mixon Hole. Mulberry Divers, the main operator that uses the site, tries to operate the Professional Association of Diving Instructors (PADI) Aware scheme, which includes providing divers who using their facilities with a clear brief on not touching wildlife and reinforcing the need for good buoyancy control. If they see people being irresponsible, they will ask them to stop (Natural England Stakeholder Interview for rMCZ Reference Area 12 Mixon Hole, November 2011). Shot lines are used to provide an aid to the depth of the Mixon Hole and to act as a visual cue. Shot lines can drag across the cliff face and sea bed but if their use were to be prohibited, this could result in significantly more damage, as divers would be less able to steady themselves and would be likely to hold on to the cliff and ledges (Natural England Stakeholder Interview for rMCZ Reference Area 12 Mixon Hole, November 2011).	A screw anchor with a buoyed riser has been suggested to mitigate the impacts of shot lines used by divers, which would minimise the impacts of the management requirements for the rMCZ Reference Area on recreational divers using the site (Natural England Reference Area mitigation spreadsheet, January 2012). The costs of this have not been estimated. Because the IA assumes that recreational users of MCZs can be expected to adopt best practice in the absence of MCZs, the costs of developing a specific code of conduct, which may be needed to encourage this, are not assessed.

Table 2d. Recreation – spear fishing	**rMCZ 25.1, Reference area 12 Mixon Hole**
Source of costs of the MCZ	

Table 2d. Recreation – spear fishing	**rMCZ 25.1, Reference area 12 Mixon Hole**
Management scenario 1: Closure of the rMCZ Reference Area to spear fishing	
Baseline description of activity	**Costs of impact of MCZ on the sector**
Spear fishermen are known to use the Mixon Hole but it has not been possible to obtain information on numbers or any further details (Natural England Stakeholder Interview for rMCZ Reference Area 12 Mixon Hole, November 2011).	Closure of the rMCZ Reference Area to spear fishering will impact on those individuals that undertake this activity if there are not other locations where they can carry it out in the area.

Table 2e: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 25.2 Reference Area 12 Mixon Hole**
Oil and gas related activities (including carbon capture and storage)	
This rMCZ Reference Area overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 27th Seaward Licensing Rounds). However, it is unlikely that any oil and gas (including carbon capture and storage) infrastructure will be proposed in future in this rMCZ Reference Area due to its location and size (DECC, pers. comm., 2012). Impacts of rMCZ Reference Areas 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)

Table 3. Human activities in the site that are not negatively affected by the recommended Marine Conservation Zone (rMCZ) (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 25.2 Reference Area 12 Mixon Hole**
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).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ 25.2, Reference Area 12 Mixon Hole**	
Baseline	**Beneficial impact**	
Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption. Subtidal mixed sediments are important spawning and nursery grounds for juvenile commercial species such as flatfish and bass, and peat and clay exposures may provide fisheries habitat (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 rMCZ 25.2 Table 1 for details). There is no on-site fishing activity in the rMCZ Reference Area. It has not been possible to estimate the value of the off-site benefits that derive from the potential spawning and nursery area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. As no fishing will be permitted within the rMCZ Reference Area, no on-site benefits will be realised.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ 25.2, Reference Area 12 Mixon Hole**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption and recreation services. Subtidal mixed sediments are important spawning and nursery grounds	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to closure of	Anticipated direction of change: ⇧ Confidence:

Table 4b. Recreation	**rMCZ 25.2, Reference Area 12 Mixon Hole**	
for certain fish species such as flatfish and bass, and peat and clay exposures may provide fisheries habitat (Fletcher and others, 2011). These habitats will therefore benefit recreational 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 (see rMCZ 25.2 Table 1 for details). Angling is carried out in this rMCZ Reference Area as described in Table 2b. 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.	the rMCZ Reference Area (see Table 4a). As angling will not be permitted within the rMCZ Reference Area, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers outside the rMCZ Reference Area. Such benefits may be insignificant.	Low
Diving: Diving is a very important activity in the rMCZ Reference Area as this is one of the most popular dive sites in the Balanced Seas Project Area, and among the top dive sites in England on account of its great depth close to shore (Irving, 1996; Marine Site of Nature Conservation Importance report). It has not been possible to obtain information on the frequency of dive visits.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. The recovery of the features to reference condition may improve their functioning as support for fish and other marine wildlife (including increases in size and diversity of species) potentially benefiting diving within the rMCZ Reference Area. The designation may lead to an increase in diving visits to the site, which may benefit the local economy. This increase may represent an overall increase in UK diving and/or a redistribution of location preferences.	
Wildlife watching: Wildlife watching is not known to take place in the site.	N/A	N/A
Other recreation: No other recreational activities are known to take place in the site.	N/A	N/A

Table 4c. Research and education	**rMCZ 25.2, Reference Area 12 Mixon Hole**

Table 4c. Research and education	**rMCZ 25.2, Reference Area 12 Mixon Hole**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. There are no known research activities under way, although the site was surveyed in the 1990s as part of the survey of Marine Sites of Nature Conservation Importance.	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of education services. No known education activities are associated with the site.	MCZ Reference Area designation may provide an opportunity to expand the focus of education events into the marine environment. Designation may aid the development of additional local (to the rMCZ Reference Area) education activities (e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ Reference Area contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services	**rMCZ 25.2, Reference Area 12 Mixon Hole**	
Baseline	**Beneficial impact**	
Regulation of pollution: N/A	N/A	N/A
Environmental resilience: N/A	N/A	N/A
Natural hazard protection: N/A	N/A	N/A

Table 4e. Non-use and option values	**rMCZ 25.2, Reference Area 12 Mixon Hole**
Baseline	**Beneficial impact**

Table 4e. Non-use and option values	**rMCZ 25.2, Reference Area 12 Mixon Hole**	
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) Reference Area and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of the rMCZ Reference Area 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 Reference Area 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.	Anticipated direction of change:  Confidence: Moderate

rMCZ 26 Hythe Bay

Site area (km^2): 41.55

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 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).				
1b. Baseline condition of MCZ features and impact of the MCZ				
Feature	**Area of feature (km2)**	**No. of occurrences**	**Baseline**	**Impact**
Broad-scale habitats				
A5.3 Subtidal mud	37.02	-	Unfavourable condition	Recover to favourable condition
Habitats of conservation importance				
Mud habitats in deep water	-	79 records	Unfavourable condition	Recover to favourable condition
Seapens & burrowing megafauna	-	28 records	Unfavourable condition	Recover to favourable condition

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 26, Hythe Bay
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of MCZ on the sector**
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

Table 2a. Archaeological heritage	**rMCZ 26, Hythe Bay**
	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). 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.

Table 2b. Commercial fisheries	**rMCZ 26, Hythe Bay**
Source of costs of the recommended Marine Conservation Zone (rMCZ) The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. 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. ***Management scenario 1:*** No additional management (Statutory Nature Conservation Bodies (SNCB) informed scenario). ***Management scenario 2:*** 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). ***Management scenario 3:*** Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (SNCB informed scenario).	
Summary of all fisheries 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 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)	

Table 2b. Commercial fisheries **rMCZ 26, Hythe Bay**

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
Bottom trawls: 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
Dredges: 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 *£460
Nets: 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.
Pots and traps: 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

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 26, Hythe Bay</th></tr>
<tr><td></td><td>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.</td></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td></td></tr>
<tr><td></td><td>The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:
<table>
<tr><th>£m/yr</th><th>Scenario 1</th><th>Scenario 2</th><th>Scenario 3</th></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.003</td><td>0.075</td></tr>
<tr><td>GVA affected</td><td>0.000</td><td>0.001</td><td>0.033</td></tr>
</table>

An interview with a representative of the Folkestone fleet (IA questionnaire 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.</td></tr>
<tr><td>Baseline description of non-UK fisheries</td><td>Costs of impact of rMCZ on non-UK commercial fisheries</td></tr>
<tr><td></td><td>None.</td></tr>
</table>

2c. National defence	rMCZ 26, Hythe Bay

2c. National defence	**rMCZ 26, Hythe Bay**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. The MOD will also incur costs in revising environmental tools and charts to include MCZs.	
Baseline description of activity	**Cost of impact of rMCZ to the sector**
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 (they are not assessed for this site alone).

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

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 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).

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 4a. Fish and shellfish for human consumption	**rMCZ 26, Hythe Bay**

Table 4a. Fish and shellfish for human consumption		**rMCZ 26, Hythe Bay**
Baseline	**Beneficial impact**	
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. 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). 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.	If the conservation objectives of the features are achieved, subtidal mud and the other features in this site will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. 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. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation		**rMCZ 26, Hythe Bay**
Baseline	**Beneficial impact**	
Angling: 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. Subtidal mud habitats support nursery grounds for many juvenile	If the conservation objectives of the features are achieved, all of the features will be recovered to favourable condition. 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	Anticipated direction of change: ⇧ Confidence:

Table 4b. Recreation		**rMCZ 26, Hythe Bay**
commercial fish species, which are therefore important habitats for fish and shellfish fisheries (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). 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. 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.	Table 4a). 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. 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.	Low
Diving: 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 rMCZ is used for shore diving, particularly from Sandgate and along to Hythe (www.oceanodyssey.co.uk/kentshoredives.htm) and boat diving on the wrecks takes place in the rMCZ. It has not been possible to estimate the value derived from diving in the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: Low
Wildlife watching: 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 unfavourable condition (see Table 1 for details).	If the conservation objectives of the features are achieved, all of the features will be recovered to favourable condition. 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	Anticipated direction of change: ⇧ Confidence:

Table 4b. Recreation		**rMCZ 26, Hythe Bay**
The coastal path along Hythe affords good wildlife watching opportunities (Freewebs\Folkestonebirds Website), predominantly birds. It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	improve the quality of wildlife watching at the site and therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase may represent 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.	Low
Other recreation: 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 rMCZ lies on a stretch of coastline popular for other recreational activities including kite surfing (Green Traveller Website) and coastal walking with coastal paths available for visitors which loops in front of the bay and along the canal behind (Freewebs\Folkestonebirds Website) It has not been possible to estimate the value derived from recreation and tourism services in the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: Low

Table 4c. Research and education		**rMCZ 26, Hythe Bay**
Baseline	**Beneficial impact**	
Research: 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. No known formal research activities are currently carried out in the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence:

		High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity occurs in the rMCZ.	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. Non-visitors may benefit if the rMCZ contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services	**rMCZ 26, Hythe Bay**
Baseline	**Beneficial impact**
Regulation of pollution: 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). ***Environmental resilience:*** The features of the site are not known to contribute to resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** The features of the site are not known to contribute to local flood and storm protection (Fletcher and others, 2011). It has not been possible to estimate the value derived from regulating services associated with the rMCZ.	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. 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. 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.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ 26, Hythe Bay**
Baseline	**Beneficial impact**

Table 4e. Non-use and option values		**rMCZ 26, Hythe Bay**
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an ecologically coherent network of 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. Examples of these values are shown in (Ranger, Lowe, Sanghera, & 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. Source: Ranger and others. (2011)	Anticipated direction of change:  Confidence: Moderate

rMCZ 26. Reference Area 8 Hythe Flats

Site area (km^2): 0.56

Table 1. Conservation impacts			rMCZ 26, Reference Area 8 Hythe Flats	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) Reference Area encompasses a small subtidal area near the seaward boundary of rMCZ 26 (Hythe Bay) which would protect an area of sea-pens and burrowing megafauna, mud habitats in deep water and subtidal mud, all three of which are supported by biotope data collated by the Environment Agency. This is one of only two locations in the Balanced Seas Project Area where sea-pens and burrowing megafauna habitat occurs. The wider rMCZ is extremely species-rich and is considered to be a biodiversity hotspot containing many species rare in south-east England (e.g. Spoonworm and a burrowing anemone), to which this site will contribute. 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**
Broad-scale habitats				
A5.3 Subtidal mud	37.02	-	Unfavourable condition	Recover to favourable condition
Habitats of Conservation Importance				
Mud habitats in deep water	-	79 records	Unfavourable condition	Recover to favourable condition
Seapens & burrowing megafauna	-	28 records	Unfavourable condition	Recover to favourable condition

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

Table 2a. Archaeological heritage	rMCZ 26, Reference Area 8 Hythe Flats
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
There is no evidence to indicate the presence of archaeological features within this site (English Heritage, 2012). Balanced Seas understood from fishers that there is a wreck in this site (Balanced Seas Final Recommendations Report.,	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

Table 2a. Archaeological heritage	**rMCZ 26, Reference Area 8 Hythe Flats**
2011).	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). 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.

Table 2b. Commercial fisheries	**rMCZ 26, Reference Area 8 Hythe Flats**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area Closure of entire site to all gear types.* *This site was agreed to as a Reference Area by the Balanced Seas regional stakeholder group when developing the management scenario for rMCZ 26 (see Scenario 2, Table 2b in tables for rMCZ 26).	
Summary of all fisheries: The rMCZ Reference Area is non-coastal and within the 6nm limit. The site is included in rMCZ 26 Hythe Bay. There is little trawling, netting and potting taking place in the rMCZ Reference Area. More detail on the approach used for the fisheries method is provided in Annexes H7 and N4. It is unknown how many vessels use this rMCZ Reference Area. Estimated annual value of landings from the rMCZ Reference Area: £0.001m/yr. (Due to resolution issues of the MCZ Fisheries Model and the small size of many rMCZ Reference Areas in the Balanced Seas region, some fisheries landings values may be inaccurate. They have been included as a precautionary measure and to avoid underestimating the economic impact of a site.)	
Baseline description of UK commercial fisheries	**Costs of impact of rMCZ on UK commercial fisheries**
Bottom trawls:. Vessel numbers unknown	Estimated annual value of UK vessel landings affected: *£m/yr* | Scenario 1

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ 26, Reference Area 8 Hythe Flats</th></tr>
<tr><td>Estimated total value of landings from the rMCZ Reference Area: £360/yr</td><td colspan="2"><table><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £360yr</td></tr>
<tr><td>Dredges: Vessel numbers unknown,

Estimated total value of landings from the rMCZ Reference Area: £70/yr.</td><td colspan="2">Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £70/yr</td></tr>
<tr><td>Mid-water trawls: Vessel numbers unknown.

Estimated total value of landings from the rMCZ Reference Area: £180/yr.</td><td colspan="2">Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £180</td></tr>
<tr><td>Nets: Vessel numbers unknown.

Estimated total value of landings from the rMCZ Reference Area: £570/yr</td><td colspan="2">Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.001</td></tr></table></td></tr>
<tr><td>Pots and traps: Vessel numbers unknown.

Estimated total value of landings from the rMCZ Reference Area: £120/yr (MCZ Fisheries Model).</td><td colspan="2">Estimated annual value of UK vessel landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £120/yr</td></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td colspan="2"></td></tr>
<tr><td></td><td colspan="2">Estimated annual value of UK vessel landings and gross value added (GVA) affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.001</td></tr><tr><td>GVA affected</td><td>0.001</td></tr></table>The local fishing fleet agreed to halt trawling in this rMCZ Reference Area, which is one of several small 'management areas' within rMCZ 26, due to the low level of fishing activity here (South Kent Local Group meeting, July 2011). The site is not expected to impact the fishing industry.</td></tr>
<tr><td>Baseline description of non-UK fisheries</td><td colspan="2">Costs of impact of rMCZ on non-UK commercial fisheries</td></tr>
</table>

Table 2b. Commercial fisheries	**rMCZ 26, Reference Area 8 Hythe Flats**
	None.

Table 2c. Recreational angling	**rMCZ 26, Reference Area 8 Hythe Flats**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area Closure of the entire site to all recreational angling.	
Baseline description of activity	**Costs of impact of MCZ on the sector**

<table>
<tr><th colspan="2">Table 2c. Recreational angling rMCZ 26, Reference Area 8 Hythe Flats</th></tr>
<tr><td>Angling is an important activity in the rMCZ Reference Area and in the wider area, covered by Hythe rMCZ 26. Four Stakmap interviews indicated that areas used for recreational angling (charter boats and boat fishing) overlapped with the rMCZ Reference Area. The interviewees represented 4 local clubs (176 people/year) and charter boat operators representing 1,000 anglers/year. According to a local charter boat operator, a total of 26 vessels (3 based at Dungeness, 7 at Dover, 2 at Folkestone, 8 at Ramsgate, 3 at Rye and 3 beach-launched vessels at Deal) probably fish within the site due to its proximity to their launch port (D. Hancock, RSG charter boat operator, pers. comms., January, 2012). In particular, the site is used by 14 vessels based at Rye, Folkestone, Dungeness, Deal and Dover because of its proximity. They can take up to 8 anglers per trip. The same operator estimated that these vessels could fish in this inshore site for up to 150 days a year. The Balanced Seas project team consider this to be an over estimate as charter boats typically work in total 200 days a year (as indicated by StakMap interviews, 2010) and visit a number of sites. The estimated average revenue per charter vessel is £300/day (D. Hancock, Regional Stakeholder Group (RSG) charter boat representative, email, 5th December, 2011). .</td><td>Anglers and charter boat operators may respond to the closure to angling by fishing in other areas nearby if the weather or fish movements allow. However, there may be times when the rMCZ Reference Area is the only suitable site for angling in the area (D. Hancock, Regional Stakeholder Group (RSG) charter boat representative pers. comm., January 2012). Some anglers who fish from private boats have indicated that they would agree to cease fishing in this small area (RSG August 2011).

To avoid underestimation of costs, the IA assumes that charter boat operators will lose all revenue from angling trips. Since the estimate of 150 days use of the site (D. Hancock, RSG charter boat representative) is considered an over-estimate, the IA is assuming that just one a third (50 days) of this number is more realistic, given the charter boats' use of a number of sites, and allowing for displacement of some of their activity to alternative locations. Consequently, Balanced Seas estimates that on average each of the 14 vessels loses revenue of £300/day for 50 days a year. Since the charter vessels using this site may be capable of fishing elsewhere nearby,depending on the weather and fish movements, the value of actual revenue lost may nevertheless be lower than the estimate that is provided here.

<table>
<tr><th>.£m/yr</th><th>Scenario 1</th></tr>
<tr><td>Estimated value of charter boat revenue affected</td><td>0.210</td></tr>
<tr><td>GVA affected</td><td>0.099</td></tr>
</table>
</td></tr>
</table>

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

Table 3. Human activities in the site that are not negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	**rMCZ 26 Reference Area 8 Hythe Flats**
Recreation (except for the activities listed above in table 2) 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).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions in Annex H.

Table 4a. Fish and shellfish for human consumption		**rMCZ 26, Reference Area 8 Hythe Flats**
Baseline	**Beneficial impact**	
Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption. Subtidal mud is an important nursery area for many species, including for juvenile commercial species such as flatfish 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 rMCZ 26 Table 1 for details). A description of on-site fishing activity in the rMCZ Reference Area,	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ Reference Area. The costs of this are set out in Table 2b. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Closure of the rMCZ Reference Area to fishing activity will reduce the on-site fishing mortality of species, but as the site is small it is unclear whether this would benefit stocks of mobile commercial finfish species.	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ 26, Reference Area 8 Hythe Flats**
which involves a number of gear types, and the value derived from it is set out in Table 2b. It has not been possible to estimate the value of the off-site benefits that derive from the spawning and nursery area.	As no fishing will be permitted within the rMCZ Reference Area, no on-site benefits will be realised.	

Table 4b. Recreation		**rMCZ 26, Reference Area 8 Hythe Flats**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption and recreation services. Subtidal mud habitats support nursery grounds for certain fish species (Fletcher and others, 2011) and are therefore beneficial to recreational 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 unfavourable condition (see rMCZ 26 Table 1 for details). Angling is an important activity in this rMCZ Reference Area and a description of this activity is set out in Table 2c. 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.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to closure of the rMCZ Reference Area (see Table 4a). As angling will not be permitted within the rMCZ Reference Area, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers outside the rMCZ Reference Area. Such benefits may be insignificant.	Anticipated direction of change: ⇧ Confidence: Low
Diving: Diving and snorkelling may take place on the wrecks in the site.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. The recovery of the features to reference condition may improve their functioning as support for fish and other marine wildlife (including increases in size and diversity of species)	Anticipated direction of change: ⇧ Confidence:

Table 4b. Recreation		**rMCZ 26, Reference Area 8 Hythe Flats**
	potentially benefiting diving within the rMCZ Reference Area. Any increase may represent a redistribution of dive location preferences rather than an overall increase in diving.	Low
Wildlife watching: Wildlife watching is not known to take place in the site.	N/A	N/A
Other recreation: No other recreational activities are known to take place in the site.	N/A	N/A

Table 4c. Research and education		**rMCZ 26, Reference Area 8 Hythe Flats**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. No known research activities take place in the site.	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of education services. No known education activities take place in the site.	MCZ Reference Area designation may provide an opportunity to expand the focus of education events into the marine environment. Designation may aid the development of additional local (to the rMCZ Reference Area) education activities(e.g. events and interpretation boards), from which visitors to the site would derive benefit. Non-visitors may benefit if the rMCZ Reference Area contributes to wider provision of educational resources (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Moderate

Table 4d. Regulating services	**rMCZ 26, Reference Area 8 Hythe Flats**	
Baseline	**Beneficial impact**	
Regulation of pollution: Subtidal mud contributes to the bioremediation of waste and sequestration of carbon (subtidal sediments) (Fletcher and others, 2011). ***Environmental resilience:*** N/A ***Natural hazard protection*****:** As the site is offshore, its features do not contribute to the delivery of this service. It has not been possible to estimate the value derived from regulating services associated with the rMCZ Reference Area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of subtidal mud and closure to fishing could increase the site's benthic biodiversity and biomass, improving the regulating capacity of its habitats. Designating the recommended Marine Conservation Zone Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change:  Confidence: Low

Table 4e. Non-use and option values	**rMCZ 26, Reference Area 8 Hythe Flats**	
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) Reference Area and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of the rMCZ Reference Area 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 Reference Area 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.	Anticipated direction of change:  Confidence: Moderate

rMCZ 28 Utopia

Site area (km^2): 2.71

Table 1. Conservation impacts				rMCZ 28, Utopia
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) would protect one of only two examples of fragile sponge and anthozoan communities documented in the Balanced Seas Project Area. The boundaries incorporate an area of bedrock and large boulders hosting rich communities of sponges, anthozoans, hydroids and bryozoans. This bedrock feature is thought to be locally unique, being an isolated area of rock surrounded by extensive sediment. The key feature of this site is the discrete group of rock outcrops and boulders that support a rich biological community, standing proud on an otherwise uninterrupted sediment-covered sea bed. This site is not associated with any existing designation. 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**
Habitats of conservation importance				
Fragile sponge & anthozoan communities	-	1 record	Unfavourable condition	Recover to favourable condition

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

Table 2a. Aggregate Extraction — **rMCZ 28, Utopia**

Source of costs of the rMCZ

Scenario 1: Increase in costs of assessing environmental impacts for future licence applications for existing production licences and current licence applications within 1km of an rMCZ. Also additional costs for provision of information that will be used for these assessments, which will be incurred for the entire suite of sites. This provides the best estimate of impact.

Scenario 2: 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.

Baseline description of activity	Costs of effect of MCZ on the sector		
There are 3 licensed aggregate extraction production areas within 1km of the rMCZ and an additional area for which a licence application has been submitted. It is anticipated that the Environmental Impact Assessment for renewal of these licences will be conducted in the following years:	Average annual site-specific costs £m/yr	Scenario 1	Scenario 2
	Cost to the operator	0.007	Assessed for the

• for aggregate extraction production licence no. 351, for which an application is currently being considered: in 2026 (based on information provided by The Crown Estate (pers. comm., 2011), assuming that the licence is awarded in 2012) ; • for aggregate extraction production licence nos. 395/1 and 395/2: in 2013 and 2028 (based on information provided by The Crown Estate (pers. comm., 2011)) ;	<table><tr><td></td><td></td><td>suite of sites</td></tr></table> ***Scenario 1 :*** 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. ***Scenario 2:*** An assessment of the additional costs of 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.

Table 2a. Archaeological heritage	**rMCZ 28, Utopia**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
An archaeological feature has been recorded within the rMCZ Reference Area (see tables below) found within this rMCZ (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 for 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.

Table 2b. Commercial fisheries **rMCZ 28, Utopia**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. 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.

Management scenario 1: Closure of entire rMCZ to bottom trawls and dredges to protect areas of fragile sponge and anthozoan communities (Balanced Seas informed scenario).

Management scenario 2: Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (Statutory Nature Conservation Bodies informed scenario).

Summary of all fisheries This site is wholly within the 6 nautical mile (nm) limit and is fished only by UK vessels. The majority of vessels fishing the rMCZ are based in Portsmouth/Gosport, Selsey and Bembridge and are under 15 metres in length. The main fishing method used is potting. There is low set netting and bottom trawling effort in the site (MCZ Fisheries Model). Bottom trawling activity does not overlap the main rock features. Certain commercial fishing restrictions are already in existence (listed in Annex E1). Sussex Inshore Fisheries and Conservation Authority (IFCA) byelaws prohibit the use of scallop dredges within 3 nm of the coast, and oyster dredges throughout the Sussex IFCA District. 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: £0.009m/yr.

Baseline description of UK commercial fisheries	**Costs of impact of rMCZ on UK commercial fisheries**
Bottom trawls: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.001m/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 Value of landings affected | 0.001 | 0.001
Dredges: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £220/yr (MCZ Fisheries Model).	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

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 28, Utopia</th></tr>
<tr><td></td><td>
<table>
<tr><td>Value of landings affected</td><td><0.001*</td><td><0.001*</td></tr>
</table>
* £220/yr
This value is likely to be an overestimate as Sussex IFCA byelaws prohibit the use of scallop dredges within 3 nm of the coast, and oyster dredges throughout the Sussex IFCA District(for more details see Annex E1).
</td></tr>
<tr><td>Hooks and lines Vessel numbers unknown.Estimated total value of landings from the rMCZ: £320/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line 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><0.001*</td></tr>
</table>
* £320/yr
In establishing the draft conservation objectives, the site's feature 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 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.</td></tr>
<tr><td>Nets: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.002m/yr (MCZ Fisheries Model).</td><td>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>0.002</td></tr>
</table>
In establishing the draft conservation objectives, the site's feature 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.</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ 28, Utopia</th></tr>
<tr><td colspan="2">Pots and traps: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.004m/yr (MCZ Fisheries Model).</td><td>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>0.004</td></tr></table>In establishing the draft conservation objectives, the site's feature 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.</td></tr>
<tr><td colspan="2">Total direct impact on UK commercial fisheries</td><td>Total direct impact on UK commercial fisheries</td></tr>
<tr><td colspan="2"></td><td>The estimated annual value of UK landings and gross value added (GVA) 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>0.001</td><td>0.007</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.003</td></tr></table>This value is likely to be an overestimate as Sussex IFCA byelaws prohibit the use of scallop dredges within 3 nm of the coast, and oyster dredges throughout the Sussex IFCA District (for more details see Annex E1).</td></tr>
<tr><td colspan="2">Baseline description of non-UK fisheries</td><td>Costs of impact of rMCZ on non-UK commercial fisheries</td></tr>
<tr><td colspan="2"></td><td>None.</td></tr>
</table>

<table>
<tr><th colspan="2">2c. National defence</th><th>rMCZ 28, Utopia</th></tr>
<tr><td colspan="3">Source of costs of the recommended Marine Conservation Zone (rMCZ)

Mitigation of impacts of Ministry of Defence (MOD) activities on features protected by the suite of rMCZs will be provided by additional planning considerations during operations and training. It is not known whether mitigation will be required for features protected by this site. The MOD will also incur costs in revising environmental tools and charts to include MCZs.</td></tr>
<tr><td colspan="2">Baseline description of activity</td><td>Costs of impact of rMCZ on the sector</td></tr>
</table>

The MOD is known to make use of the site. Activities include: air general, acoustic trials, flares, mine counter measures, smoke, sea bed sampling, towed array (surveillance systems) and amphibious.	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).

Table 2d. Renewable energy – tidal energy **rMCZ 28, Utopia**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

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

Management scenario 2: Increase in costs of assessing environmental impacts for licence applications and provision of additional mitigation of impacts of cable protection (relative to the mitigation provided in the baseline).

Baseline description of activity	**Costs of impact of rMCZ on the sector**
There is potential for future developments that generate electricity using the tidal energy resource in this rMCZ as it overlaps with the East of Isle of Wight Area of Potential, which has anticipated energy generation potential of 100MW (DECC, pers. comm., 2011). It is assumed for the purpose of the IA that there would be 1 licence application within the time frame of the IA. However, it is unlikely, though still possible, that deployment of tidal energy technology will take place in the rMCZ during the 20 year period covered by the IA.	The estimated cost to tidal energy developers of the rMCZ is expected to fall within the following range of scenarios: *£m/yr* | Scenario 1 | Scenario 2 Cost | 0.001 | 0.001 ***Scenario1:*** One licence application for the tidal energy installations could be required to consider the potential effects of the construction and operational activities on the features protected by the rMCZ and the potential to achieve the rMCZ conservation objectives. This is expected to result in one-off costs of £0.011m in 2015 (based on, per broad-scale habitat assessed, 6 days of a consultant's time at £700/day + 1 day for legal review at £800/day) with a present value cost of £0.009m. ***Scenario 2:*** The costs would be the same as for Scenario 1 plus the additional costs of mitigating impacts of cable protection. As the proposed cable routes are unknown, it is unclear whether routes for any inter-array or export cables will be sought that pass through the rMCZ, and if they are what

Table 2d. Renewable energy – tidal energy	rMCZ 28, Utopia
	length of cable protection may be required. If alternative cable protection is required to mitigate impacts, this is estimated to cost £1m/km. However, both Natural England and JNCC have said that this additional requirement is unlikely to be needed and so this additional cost is anticipated to be unlikely (Natural England and JNCC, pers. comm., 2012).

Table 2e: Other impacts that are assessed for the suite of MCZs and not for this site alone	rMCZ 28, Utopia
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 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)

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 28, Utopia
Commercial fisheries (mid-water trawls) Recreation Research and education Shipping	

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 4a. Fish and shellfish for human consumption	rMCZ 28, Utopia
Baseline	**Beneficial impact**

Table 4a. Fish and shellfish for human consumption		**rMCZ 28, Utopia**
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. High and moderate energy circalittoral rock is an important location for commercial inshore fishing activity, particularly for crab and lobster (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). The main fishing method used is potting. There is low set netting and bottom trawling effort in the site. A description of on-site fishing activity and the value derived from it is set out in Table 2b.	If the conservation objective of the feature is achieved, the feature will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. 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. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation		**rMCZ 28, Utopia**
Baseline	**Beneficial impact**	
Angling: 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. Infralittoral rock supports rich biodiversity within the site and provides important habitats for fish and shellfish fisheries (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). The rMCZ is an important site for both private boat anglers and charter	If the conservation objective of the feature is achieved, the feature will be recovered to favourable condition. 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. 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.	Anticipated direction of change: ⇧ Confidence: Low

boats from the Isle of Wight and Hampshire particularly Langstone Harbour (Stakmap 2010). The generally high biodiversity due to the complex habitats within the site is likely to help support potential on-site and off-site fisheries. 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 potential spawning and nursery area.		
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. Infralittoral rock habitat supports internationally important fish and shellfish fisheries (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). Due to its offshore location, the rMCZ is not important for wildlife watching. However, the site has particularly high biodiversity and abundant fish populations, which potentially support foraging sea birds and marine mammals. The site occurs within an area of the English Channel used by ferries, which may carry wildlife watchers, particularly those interested in marine mammals. It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	If the conservation objective of the feature is achieved, some of the features will be recovered to favourable condition. Others will be maintained in favourable condition. 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.	Anticipated direction of change: ⇧ Confidence: Low
Other recreation: Other recreational activities are not known to take place in the rMCZ.	N/A	N/A

Table 4c. Research and education		**rMCZ 28, Utopia**
Baseline	**Beneficial impact**	
Research: 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. No known formal research activities are currently carried out in the rMCZ. However, ferries crossing the English Channel may be used by marine mammal observers, whose data contribute to national databases. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity occurs in the rMCZ.	As the rMCZ is approximately 9km 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 external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ 28, Utopia**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site are not known to contribute to contribute to the regulation of pollution. ***Environmental resilience:*** The features of the site are not known to contribute to contribute to the resilience and continued regeneration of marine ecosystems.	If the conservation objective of the feature is achieved, fragile sponge & anthrozoan communities recovered to favourable condition. Fragile sponge & anthrozoan communities are not known to contribute to regulating services. However, a potential reduction in the use of bottom towed fishing gear may increase the site's	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ 28, Utopia**
Natural hazard protection: As the site is offshore, its features are not thought to contribute to the delivery of this service.	benthic biodiversity and biomass, improving the regulating capacity of its habitats. 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.	

Table 4e. Non-use and option values		**rMCZ 28, Utopia**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an ecologically coherent network of 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.	Anticipated direction of change: ⇧ Confidence : Moderate

rMCZ 28. Reference Area 13 North Utopia — Site area (km^2): 0.28

Table 1. Conservation impacts			rMCZ 28, Reference Area 13 North Utopia	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) Reference Area lies within rMCZ 28 (Utopia) and is the location for one of the only two examples of fragile sponge and anthozoan communities in the Balanced Seas Project Area. It is found on a prominent area of bedrock reef and large boulders that stand out from the otherwise sediment-dominated sea bed. A single point record denotes the fragile sponge and anthozoan feature, but additional video footage and still images have been collected to demonstrate the extent of the habitat. The wider rMCZ supports a rich biological community based on a discrete group of rock outcrops and boulder, to which the rMCZ Reference Area may contribute. 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**
Broad-scale habitats				
A5.4 Subtidal mixed sediments	-	-	Unfavourable condition	Recover to favourable condition
Habitats of Conservation Importance				
Subtidal sands & gravels	0.08	-	Unfavourable condition	Recover to favourable condition
Fragile sponge & anthozoan communities	-	1 record	Unfavourable condition	Recover to favourable condition

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

Table 2a. Aggregate extraction	rMCZ 28, Reference Area 13 North Utopia
Source of costs of the recommended Marine Consevation Zone (rMCZ) Reference Area:	
Management scenario 1: 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. Aggregate extraction continues outside the rMCZ Reference Area and the operator incurs additional monitoring costs to assess the impact of this activity on the MCZ features. The Balanced Seas Regional Stakeholder Group (RSG) specified that the rMCZ Reference Area should only be taken forward if the existing licensed activities taking place adjacent to it are allowed to continue. This provides the best estimate of impact.	
Management scenario 2: 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. Closure of the aggregate extraction licence area to mitigate impacts on features in the rMCZ Reference Area.	

Table 2a. Aggregate extraction **rMCZ 28, Reference Area 13 North Utopia**

Baseline description of activity

Future licence applications:

There are 3 licensed aggregate extraction production areas within 1km of the rMCZ and an additional area for which a licence application has been submitted. It is anticipated that the Environmental Impact Assessment for renewal of these licences will be conducted in the following years:

- for aggregate extraction production licence no. 351, for which an application is currently being considered: in 2026 (based on information provided by The Crown Estate (pers. comm., 2011), assuming that the licence is awarded in 2012) ;
- for aggregate extraction production licence nos. 395/1 and 395/2: in 2013 and 2028 (based on information provided by The Crown Estate (pers. comm., 2011)) .

Operations:

Licence application area 395 lies immediately adjacent to this site. Two companies Kendall Brothers (Portsmouth) Limited and Tarmac Marine Dredging Limited operate this licence. It represents a significant portion of their business. It is the only aggregate licence operated by Kendall Brothers Limited.

Although the licence has been worked for 13 years, considerable resources remain and the current licence operators are currently seeking a replacement licence to allow dredging to continue for a further 15 years beyond the end of March 2013 to extract a maximum total of 18.75 million tonnes (which has a potential asset value over the licence period 2013 to 2028 of £187.5m). In support of this application, various environmental studies have been undertaken at both a site-specific scale and as part of a wider industry regional environmental assessment (British Marine Aggregate Producers Association, pers. comm., 2012).

Costs of impact of rMCZ

The Balanced Seas Regional Stakeholder Group (RSG) specified that the rMCZ Reference Area should only be taken forward if the existing licensed activities taking place adjacent to it are allowed to continue.

Average annual site-specific costs £m/yr	Scenario 1	Scenario 2
Additional costs to the operator for future licence applications	0.007	Assessed for the suite of sites
Costs to operator of mitigation	0.010	1.662 plus unknown costs
Total	0.017	1.662 plus unknown costs

Scenario 1: 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.

BMAPA has estimated that ongoing monitoring of the site to assess the impacts will cost £0.010/yr over the lifetime of the licence term (from 2013 to 2028 – see table of costs above) to cover the additional survey effort, analysis and reporting needed (BMAPA, pers. comm., 2012).

Scenario 2: 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.

BMAPA (pers. comm., 2011) estimates that closure of the aggregate extraction

Table 2a. Aggregate extraction	**rMCZ 28, Reference Area 13 North Utopia**
	area would cost the operators £1.661m/yr (this is the highest estimate of cost provided by BMAPA, to avoid underestimation - see table of costs above). This estimate is based on the assumption that the tonnage lost from the closure of the area is replaced with production from a licensed area 40km away, which would result in additional costs because a vessel would need to change from a 12 hour cycle time to a 24 hour cycle time. 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. Costs to the operators would include loss of the sunk investment in the site, the loss of asset value arising from the resources in a licence area being constrained, and costs incurred as a result of the time it would take to successfully secure a new licence, which could take up to 3 years (this cost would be particularly significant if the operator does not have an alternative source of supply to use) (BMAPA, pers. comm., 2012). BMAPA has indicated that because licence area 395 is a significant part of the business for both its operators, the consequences for the operators of impacts that arise from the licence being constrained or even lost would be significant (pers. comm., 2011). The licence area is also expected to have an increasingly significant role in the supply of aggregates for use in construction and coastal defence in southern England in the long term (BMAPA feedback on draft IA material, 2012).

Table 2b. Archaeological heritage	**rMCZ 28, Reference Area 13 North Utopia**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area	
Increase in costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	

Table 2b. Archaeological heritage	**rMCZ 28, Reference Area 13 North Utopia**
Baseline description of activity	**Costs of impact of rMCZ on the sector**
One unidentified sea bed feature is recorded within this 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 Reference Area 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). 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.

Table 2c. Commercial fisheries	**rMCZ 28, Reference Area 13 North Utopia**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area Closure of entire site to all gear types.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
Summary of all fisheries: The rMCZ Reference Area is non-coastal and within the 6nm limit. It is located within rMCZ 28 Utopia. The majority of vessels fishing the rMCZ are based in Portsmouth/Gosport, Selsey and Bembridge and are under 15 metres in length. The main fishing method used is potting. There is a low level of set netting and bottom trawling effort in the site (FisherMap Data 2010).. Bottom trawling activity does not overlap the main rock features and it is unlikely that either bottom trawling or dredging actually occur within the site. More detail on the approach used for the fisheries method is provided in Annexes H7 and N4. Estimated total value of landings from the rMCZ Reference Area: £0.001m/yr. (Due to resolution issues of the MCZ Fisheries Model and the small size of many rMCZ Reference Areas in the Balanced Seas region, some fisheries landings values may be inaccurate. They have been included as a precautionary measure and to avoid underestimating the economic impact of a site.)	
Baseline description of UK commercial fisheries	**Costs of impact of rMCZ on UK commercial fisheries**

<table>
<tr><th>Table 2c. Commercial fisheries</th><th>rMCZ 28, Reference Area 13 North Utopia</th></tr>
<tr><td>Bottom trawls: Nine stakeholder interviewees (from Hardway Fishermen's Association) indicated that their area of operation overlapped with the rMCZ Reference Area (FisherMap Data 2010). The vessels target Dover sole using trawls and beam trawls.

Estimated total value of landings from the rMCZ Reference Area: £120/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK bottom trawl landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>*£120</td></tr>
<tr><td>Dredges: One stakeholder interviewee (from Hardway Fishermen's Association) indicated that their area of operation overlapped with the rMCZ Reference Area. The vessels use towed dredges and target oysters (FisherMap Data 2010).

Estimated total value of landings from the rMCZ Reference Area: £40/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK dredge landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £40/yr</td></tr>
<tr><td>Mid-water trawls: One stakeholder interviewee indicated that their area of operation overlaps with the rMCZ Reference Area. The vessel targets sprats and the area of overlap is small (FisherMap Data 2010).

Estimated total value of landings from the rMCZ Reference Area: £220/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK mid-water trawl landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £220/yr</td></tr>
<tr><td>Hooks and lines: Five stakeholder interviewees (Hardway Fishermen's Association and unspecified affiliations) indicated that their areas of operation overlap with the rMCZ Reference Area The vessels use rod and line and static lines to target bass. The area of overlap with the rMCZ Reference Area is small in all cases (FisherMap Data 2010).

Estimated total value of landings from the rMCZ Reference Area: £40/yr ((MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £40/yr</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2c. Commercial fisheries rMCZ 28, Reference Area 13 North Utopia</th></tr>
<tr><td>Nets: The area of operation of at least 8 vessels (Isle of Wight Fishermen's Association and unspecified affiliations) were indicated to overlap with the rMCZ Reference Area. Species targeted include bass, Dover sole, skates and rays using drift, fixed and gill nets (FisherMap Data 2010).

Estimated total value of landings from the rMCZ Reference Area: £220/yr (MCZ Fisheries Model)</td><td>The estimated annual value of UK net landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £220/yr</td></tr>
<tr><td>Pots and traps: 9 vessels (Selsey Fishermen's Association, Southern Commercial Fishermen and unspecified affiliations), targeting whelks and common lobster, indicated that the rMCZ Reference Area overlapped with their area of operation (FisherMap Data 2010).

Estimated total value of landings from the rMCZ Reference Area: £370/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK pot and trap landings affected:<table><tr><td>£m/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>* £370/yr</td></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td></td></tr>
<tr><td></td><td>The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:<table><tr><td>£mi/yr</td><td>Scenario 1</td></tr><tr><td>Value of landings affected</td><td>0.001</td></tr><tr><td>GVA affected</td><td>0.000</td></tr></table></td></tr>
<tr><td>Baseline description of non-UK fisheries</td><td>Costs of impact of rMCZ on non-UK commercial fisheries</td></tr>
<tr><td></td><td>None.</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2d. Recreational anchoring rMCZ 28, Reference Area 13 North Utopia</th></tr>
<tr><td colspan="2">Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area

Closure of entire site to all recreational anchoring (except in emergency circumstances).</td></tr>
<tr><td>Baseline description of activity</td><td>Costs of impact of rMCZ Reference Area on the sector</td></tr>
<tr><td>A total of 44 stakeholder interviews indicated that yachting interests overlap with the rMCZ Reference Area from clubs from south-east England that</td><td>The closure to anchoring is unlikely to affect the recreational sailing sector as anchoring by sailing vessels has not been identified as occurring in the site.</td></tr>
</table>

Table 2d. Recreational anchoring	**rMCZ 28, Reference Area 13 North Utopia**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area	
Closure of entire site to all recreational anchoring (except in emergency circumstances).	
Baseline description of activity	**Costs of impact of rMCZ Reference Area on the sector**
represent 40,614 individuals (11,251 people/yr). However, in all cases, the rMCZ Reference Area represents a small proportion of the overall area used even for clubs that are based locally, and there is no indication that yachting vessels anchor there. This is a popular spot for angling and angling vessels do anchor in the rMCZ Reference Area (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011).	Impacts on angling are assessed in Table 2d. Recreational anglingand charter boatsector representatives have agreed to cease activity in the site and no costs are expected.

Table 2d. Recreational angling	**rMCZ 28, Reference Area 13 North Utopia**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area	
Closure of the entire site to all recreational angling.	
Description of activity and its impact on interest features	**Costs of effect of rMCZ on the sector**
A total of 17 StakMap interviewees (9 charter boat fishing, 4 boat angling) indicated that their areas of activity overlap with the rMCZ Reference Area. Three charter boat operators indicated that they have areas of operation that substantially overlap with the rMCZ Reference Area. A local angling club said that the rMCZ Reference Area is little used by anglers from the Isle of Wight, although mainland anglers may use it (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011).	Representatives of recreational sea anglers said the impact of closure of this small area would be minimal for users from the Isle of Wight and probably also for charter boats from the mainland (Balanced Seas Solent/IOW/Hants Sites Meeting Report, July 2011). In addition, a local charter boat operator said that the site would not have a significant impact on his revenue as he and others could continue to operate in the surrounding area (S. Wall-Palmer, Langstone Harbour charter boat operator, pers. comms., December 2011). The representatives have agreed to cease angling in the rMCZ Reference Area, and no costs are expected.

Table 2e. Renewable energy – tidal energy	**rMCZ 28, Reference Area 13 North Utopia**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area	
Installation of devices and cables not permitted within the rMCZ. Increase in costs of assessing environmental impacts for licence applications with 1km of the rMCZ. It is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the	

Table 2e. Renewable energy – tidal energy	**rMCZ 28, Reference Area 13 North Utopia**
baseline.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
There is potential for future developments that generate electricity using the tidal energy resource in this rMCZ Reference Area as it overlaps with the East of Isle of Wight Area of Potential, which has anticipated energy generation potential of 100MW (Department of Energy and Climate Change, pers. comm., 2011), but the area of overlap is not known. It is assumed for the purpose of the Impact Assessment (IA) that there would be 1 licence application within the time frame of the IA. However, it is unlikely, though still possible, that deployment of tidal energy technology will take place in the rMCZ during the 20 year period covered by the IA.	The rMCZ Reference Area would be closed to tidal energy development because it involves deposition of cables and devices. It is not known whether either of these would be proposed in the site in the absence of the MCZ and what if any mitigation of impacts on MCZ features would be required. The impacts have not been estimated but could be potentially significant. Costs of mitigation could arise from siting devices and cables to avoid the rMCZ Reference Area, from mitigation of impacts of cable protection and, if necessary, from a reduction in the number of devices installed as a result of the rMCZ Reference Area. It is estimated that cables cost £1.010m/km/cable (average of estimates provided by four developers) and that use of frond mattressing to mitigate impacts of cable protection costs £1.000m/km more than the cable protection that would be used in the absence of the rMCZ. It may be that areas that would have been developed in the absence of the rMCZ will not be developed because of the site, which could impact on costs for the developer. One licence application for the tidal energy installations could be required to consider the potential effects of the construction and operational activities on the features protected by the rMCZ Reference Area and the potential to achieve the rMCZ conservation objectives. This is expected to result in one-off costs of £0.011m in 2015 (based on, per broad-scale habitat assessed, 6 days of a consultant's time at £700/day + 1 day for legal review at £800/day) with a present value cost of £0.009m.

Table 2f: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 28, Reference Area 13 North Utopia**
Oil and gas related activities (including carbon capture and storage) This rMCZ Reference Area overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 27th	

Seaward Licensing Rounds). However, it is unlikely that any oil and gas (including carbon capture and storage) infrastructure will be proposed in future in this rMCZ Reference Area due to its location and size (DECC, pers. comm., 2012). Impacts of rMCZ Reference Areas 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)

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 28. Reference Area 13 North Utopia	**rMCZ 28, Reference Area 13 North Utopia**
Recreation (except for the activities listed above in table 2) Research and education Shipping	

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions in Annex H.

Table 4a. Fish and shellfish for human consumption	**rMCZ 28, Reference Area 13 North Utopia**	
Baseline	**Beneficial impact**	
Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption. Subtidal coarse sediments and sand are important spawning and nursery grounds for juvenile commercial species such as flatfish 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 rMCZ 28 Table 1 for details).	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ Reference Area. The costs of this are set out in Table 2c. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Closure of the rMCZ Reference Area to fishing activity will reduce	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ 28, Reference Area 13 North Utopia**
A description of on-site fishing activity in the rMCZ Reference Area, which involves a number of gear types, and the value derived from it is set out in Table 2c. It has not been possible to estimate the value of the off-site benefits that derive from the spawning and nursery area.	the on-site fishing mortality of species, but as the site is small it is unclear whether this would benefit stocks of mobile commercial finfish species. As no fishing will be permitted within the rMCZ Reference Area, no on-site benefits will be realised.	

Table 4b. Recreation		**rMCZ 28, Reference Area 13 North Utopia**
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption and recreation services. Subtidal coarse sediments and sand are important spawning and nursery grounds for certain fish species such as flatfish and bass. (Fletcher and others, 2011) and thus can support recreational 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 unfavourable condition (see rMCZ 28 Table 1 for details). Angling is an important activity in this rMCZ Reference Area and a description of this activity is set out in Table 2e. 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.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to closure of the rMCZ Reference Area (see Table 4a). As angling will not be permitted within the rMCZ Reference Area, any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers outside the rMCZ Reference Area. Such benefits may be insignificant.	Anticipated direction of change: ⇧ Confidence: Low
Diving: Diving is not known to take place in the site.	N/A	N/A
Wildlife watching: Wildlife watching is not known to take place in the	N/A	N/A

Table 4b. Recreation		**rMCZ 28, Reference Area 13 North Utopia**
site.		
Other recreation: No other recreational activities are known to take place in the site.	N/A	N/A

Table 4c. Research and education		**rMCZ 28, Reference Area 13 North Utopia**
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. No known research activities take place in the site.	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change: ⇧ Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of education services. No known education activities take place in the site.	As the rMCZ Reference Area is about 10km 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 Reference Area contributes to external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ 28, Reference Area 13 North Utopia**
Baseline	**Beneficial impact**	
Regulation of pollution: Subtidal sediments contribute to the bioremediation of waste and sequestration of carbon (Fletcher and others, 2011). ***Environmental resilience:*** Subtidal sediments contribute to the resilience and continued regeneration of marine ecosystems	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of the subtidal sediments and closure to fishing could increase the site's benthic biodiversity and biomass, improving the regulating capacity of its habitats.	Anticipated direction of change: ⇧

Table 4d. Regulating services		**rMCZ 28, Reference Area 13 North Utopia**
(Fletcher and others, 2011). ***Natural hazard protection:*** As the site is offshore, its features do not contribute to the delivery of this service. It has not been possible to estimate the value derived from regulating services associated with the rMCZ Reference Area.	Designating the recommended Marine Conservation Zone Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Confidence: Low

Table 4e. Non-use and option values		**rMCZ 28, Reference Area 13 North Utopia**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the recommended Marine Conservation Zone (rMCZ) and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of its 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 Reference Area 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.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ 29 East Meridian

Site area (km^2): 407.67

Table 1. Conservation impacts				rMCZ 29, East Meridian
1a. Ecological description				
Lying over the Northern Palaeovalley and Palaeovalley Banks, which are geological remnants of the deeper ancient river system, the sea bed within the site consists of deep circalittoral rock overlain with a thin veneer of sediments. The south-eastern quarter of the site overlaps an area supporting the region's top 10% of species richness and, while the southern half of the site contains the top 25% of benthic species richness, pelagic data show that the north of the site is higher in biodiversity. Ross worm reef and subtidal sands and gravels are also found in the site. The site's sea bed shows geomorphological evidence of the eastern English Channel outburst flood, which occurred some 200,000 years ago when a huge glacial lake in the North Sea burst through the Dover Straits Isthmus which contained it, thus separating England from mainland Europe. Sonar evidence of the sea bed reveals deeply gouged channels where the floodwaters broke through. This site is not associated with any existing designation. 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**
Broad-scale habitats				
A5.2 Subtidal sand	128.37	-	Unfavourable condition	Recover to favourable condition
A5.4 Subtidal mixed sediments	279.36	-	Unfavourable condition	Recover to favourable condition
Habitats of conservation importance				
Ross worm (*Sabellaria spinulosa*) reef	313.04 m^2	-	Unfavourable condition	Recover to favourable condition
Subtidal sands and gravels	253.64 m^2	-	Unfavourable condition	Recover to favourable condition

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

Table 2a. Aggregate Extraction	rMCZ 29, East Meridian

Source of costs of the rMCZ

Management Scenario 1: Increase in costs of assessing environmental impacts for future licence applications for existing production licences and current licence applications within 1km of an rMCZ. Also additional costs for provision of information that will be used for these assessments, which will be incurred for the entire suite of sites. This provides the best estimate of impact.

Management Scenario 2: 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.

Baseline description of activity	**Costs of effect of MCZ on the sector**
There are 2 licensed aggregate extraction production areas (Nos. 464/1 and 464/2) within 1km of the rMCZ. It is anticipated that the Environmental Impact Assessment for renewal of this licence will be conducted in 2021(based on information provided by The Crown Estate (pers. comm., 2012).	<table><tr><td>Average annual site-specific costs £m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Cost to the operator</td><td>0.003</td><td>Assessed for the suite of sites</td></tr></table> ***Scenario 1 :*** 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 pMCZ 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. ***Scenario 2:*** An assessment of the additional costs of 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.

Table 2b. Commercial fisheries	**rMCZ 29, East Meridian**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of

Table 2b. Commercial fisheries **rMCZ 29, East Meridian**

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.

Management scenario 1: Closure of entire rMCZ to bottom trawls and dredges to protect areas of Ross worm reef *Sabellaria spinulosa* (Statutory Nature Conservation Bodies (SNCB) informed scenario). It is not possible to provide a zoned closure scenario due to uncertainty of the locality of the Ross worm reef.

Management scenario 2: Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (SNCB informed scenario).

Summary of all fisheries: The rMCZ is situated in the westbound Channel shipping lane. Approximately half of the rMCZ is between the 6nm and 12nm limits and half beyond the 12nm limit. Recommended MCZ 29.2 is an alternative option, which comprises the eastern half of rMCZ 29. Most UK vessels fishing the site are based in Shoreham and Newhaven and are both under 15 metres and over 15 metres in length. For those vessels that carry out scallop dredging and beam trawling, these activities have a high revenue with about 40% of ttheir income coming from scallop dredging (Regional Stakeholder Group (RSG) meeting, July 2011). Nomadic vessels travel from Newlyn, Plymouth and Brixham to use the rMCZ. The site is heavily fished by large UK scallop dredgers and beam trawlers, and by several vessels under 10 metres. The smaller vessels derive income mainly from scallop dredging followed by set netting and bottom trawling (MCZ Fisheries Model). Many Scottish scallopers land into Shoreham (these vessels fish the site because they have been displaced from their northern grounds). More detail on the approach used for the fisheries method is provided in Annexes H7 and N4.

The site is heavily fished by large Dutch, Belgian and French scallop dredgers and beam trawlers. Belgian and French vessels have historical rights to fish between 6nm and 12nm. Dutch vessels fish only beyond 12nm as they have no historical rights. A number of commercial fishing restrictions are already in existence (listed in Annex E1).

Estimated annual value of landings from the rMCZ: £1.023m/yr.

Baseline description of UK commercial fisheries	**Costs of impact of rMCZ on UK commercial fisheries**
Bottom trawls: Vessel numbers unknown. Estimated total value of landings from the rMCZ: £0.268m/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
Value of landings affected	0.268	0.268

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 29, East Meridian</th></tr>
<tr><td>Dredges: Vessel numbers unknown. Estimated total value of landings from the rMCZ: £0.602m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK dredge 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>0.602</td><td>0.602</td></tr></table></td></tr>
<tr><td>Hooks and lines: Vessel numbers unknown. Estimated total value of landings from the rMCZ: £0.008m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line 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>0.008</td></tr></table>
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.</td></tr>
<tr><td>Nets: Vessel numbers unknown. Estimated total value of landings from the rMCZ: £0.104m/yr (MCZ Fisheries Model).</td><td>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>0.104</td></tr></table>
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.</td></tr>
<tr><td>Pots and traps: Vessel numbers unknown. Estimated total value of landings from the rMCZ: £0.004m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK pot and trap landings affected is expected to fall within the following range of scenarios:</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ 29, East Meridian</th></tr>
<tr><td colspan="2"></td><td>
<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.004</td></tr>
</table>

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.
</td></tr>
<tr><th colspan="2">Total direct impact on UK commercial fisheries</th><th></th></tr>
<tr><td colspan="2"></td><td>The estimated annual value of UK landings and GVA affected is expected to fall within the following range of scenarios:
<table>
<tr><td>£million/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr>
<tr><td>Value of landings affected</td><td>0.870</td><td>0.986</td></tr>
<tr><td>GVA affected</td><td>0.398</td><td>0.451</td></tr>
</table>
</td></tr>
<tr><th colspan="2">Baseline description of non-UK fisheries</th><th>Costs of impact of rMCZ on non-UK commercial fisheries</th></tr>
<tr><td colspan="2">The rMCZ is heavily fished by large non-UK scallop dredgers and beam trawlers, and by several non-UK vessels under 10 metres. The smaller vessels derive income mainly from scallop dredging followed by set netting and bottom trawling (RSG meeting, July 2011).
Vessels from France:
• Nord-Pas de Calais/Picardie fleet: about 40 scallop dredgers from Boulogne-sur-Mer and Dunkirk use this rMCZ February–May (Direction des Pêches Maritimes et de l' Aquaculture, 2011); vessels also target red mullet and squid as they are high-value, non-quota species (A.Viera., Email feedback response to first tranche IA material, 13</td><td>Scenario 1: Non-UK vessels using bottom trawls and dredges throughout the site (notably French and Belgian vessels) will be affected by this management scenario for the rMCZ. The estimated value of French landings affected will be: £1.03m/yr (bottom trawls/dredges) (Direction des Pêches Maritimes et de l' Aquaculture , 2011). No information on the effect on other non-UK vessels is available.

Scenario 2: Non-UK vessels using static gear and bottom trawls/dredges will be affected by this management scenario for the rMCZ, particularly French</td></tr>
</table>

Table 2b. Commercial fisheries	**rMCZ 29, East Meridian**
January 2012). • Basse Normandie fleet: about 41 vessels (of which 13 are under 15 metres) fish in the rMCZ. • Haute Normandie fleet: 15 vessels are highly dependent on this rMCZ targeting scallop, Dover sole, bass (mostly high-value species) with trawls, scallop dredgers and gill nets (Direction des Pêches Maritimes et de l' Aquaculture , 2011). There is no information on number of Dutch vessels or their landings for this site. The Belgian fleet fishes the area heavily but no details are available. Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £1.03m/yr; static gears: £0.001m/yr; other gears: £0.006m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.	vessels. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be: £1.03m/yr (bottom trawls/dreges) and £0.001m/yr (static gears) (Direction des Pêches Maritimes et de l' Aquaculture , 2011). No information on the effect on other non-UK vessels is available.

Table 2c: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 29, East Meridian**
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 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)

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 29, East Meridian**
Cables (existing interconnectors and telecom cables) Commercial fisheries (mid-water trawls) Recreation Shipping	

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 4a. Fish and shellfish for human consumption		**rMCZ 29, East Meridian**
Baseline	**Beneficial impact**	
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. Circalittoral rock is an important location for commercial inshore fishing activity, particularly for crab and lobster. Subtidal sand and mixed sediment habitats are important nursery areas for many species and thus often important for fisheries (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). The site is heavily fished by large UK scallop dredgers and beam trawlers, and by several under 10 metre vessels that mainly dredge for scallops, but also set net and bottom trawl. A description of on-site fishing activity and the value derived from it is set out in Table 2b.	If the conservation objectives of the features are achieved, all features will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. 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. Potential benefits may arise on-site, for fishers permitted to fish within the rMCZ, and off-site from spill-over benefits.	Anticipated direction of change:  Confidence: Low

Table 4b. Recreation	**rMCZ 29, East Meridian**
Baseline	**Beneficial impact**

Table 4b. Recreation		**rMCZ 29, East Meridian**
Angling: 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. Circalittoral rock habitat supports rich biodiversity within the site while subtidal sand and subtidal mixed sediments support 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). 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). The rMCZ is too far offshore for private angling boats, but may be used for fishing by charter vessels on their way over to fish French waters. The potential spawning ground for fish and generally high biodiversity, due to the complex habitats within the site, are likely to help support potential on-site and off-site fisheries. 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 potential spawning and nursery area.	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. 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). 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. 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.	Anticipated direction of change:  Confidence: Low
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. Circalittoral rock, subtidal sand and subtidal mixed sediments support internationally important fish and shellfish fisheries (Fletcher and	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. The recovery of the broad scale habitats to favourable condition may improve their functioning as support for fish, bird and marine	Anticipated direction of change: 

Table 4b. Recreation		**rMCZ 29, East Meridian**
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). The rMCZ has particularly high biodiversity and abundant fish populations, which potentially support a number of foraging sea birds and marine mammals. Since it lies within an area of the English Channel used by ferries, which often carry wildlife watchers, particularly those interested in marine mammals. It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	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. 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. Visitors in transit across the Channel may benefit from any increased biodiversity through more regular sightings of birds and marine mammals. 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.	Confidence: Low
Other recreation: Other recreational activities are not known to take place in the rMCZ.	N/A	N/A

Table 4c. Research and education		**rMCZ 29, East Meridian**
Baseline	**Beneficial impact**	
Research: 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. No known formal research activities are currently carried out in the rMCZ. However, ferries crossing the English Channel are often utilised by marine mammal observers whose data contribute to national databases. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	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.	Anticipated direction of change: ⇧ Confidence: High

Table 4c. Research and education		**rMCZ 29, East Meridian**
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity occurs in the area of the rMCZ.	As the rMCZ is approximately 15km 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 external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools)	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ 29, East Meridian**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site (subtidal sediments and *Sabellaria*) contribute to both the bioremediation of waste and sequestration of carbon (Fletcher and others, 2011). ***Environmental resilience:*** The features of the site (*Sabellaria*) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** As the site is offshore, its features are not thought to contribute to the delivery of this service. It has not been possible to estimate the value derived from regulating services associated with the rMCZ.	If the conservation objectives of the features are achieved, all of the features will be recovered to favourable condition. 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 of its habitats. 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.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values		**rMCZ 29, East Meridian**
Baseline	**Beneficial impact**	

Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an ecologically coherent network of 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.	Anticipated direction of change: Confidence: Moderate

Option to rMCZ No. 29: rMCZ 29.2 East Meridian (Eastern Side) Site area (km^2): 201.46 km^2

Table 1. Conservation impacts				**rMCZ 29.2, East Meridian (Eastern Side)**
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) would protect the eastern half of the larger rMCZ 29 and it is a smaller alternative to the large rMCZ 29.2. Lying over the Northern Palaeovalley and Palaeovalley Banks, which are the geological remnants of the deeper ancient river system, the sea bed within the site is comprised of deep circalittoral rock overlain with a thin veneer of either sands or mixed sediments, or areas of thicker sands and mixed sediments. The south-eastern quarter of the site overlaps an area supporting the region's top 10% of species richness, with pelagic data showing that the north of the site is higher in biodiversity. The site's sea bed shows geomorphological evidence of the eastern English Channel outburst flood, which occurred some 200,000 years ago when a huge glacial lake in the North Sea burst through the Dover Straits Isthmus which contained it, thus separating England from mainland Europe. Sonar evidence of the sea bed reveals deeply gouged channels where the floodwaters broke through. This site is not associated with any existing designation. 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**
Broad-scale habitats				
A5.2 Subtidal sand	58.67	-	Unfavourable condition	Recover to favourable condition
A5.4 Subtidal mixed sediments	142.79	-	Unfavourable condition	Recover to favourable condition
Habitats of conservation importance				
Subtidal sands and gravels	47.38	-	Unfavourable condition	Recover to favourable condition

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

Table 2a. Aggregate Extraction	**rMCZ 29.2 (Eastern Section)**
Source of costs of the rMCZ	
Scenario 1: Increase in costs of assessing environmental impacts for future licence applications for existing production licences and current licence applications within 1km of an rMCZ. Also additional costs for provision of information that will be used for these assessments, which will be incurred for the entire suite of sites. This provides the best estimate of impact.	
Scenario 2: Increase in costs of assessing environmental impacts for future licence applications, which is assessed for the entire suite of sites and is not	

Table 2a. Aggregate Extraction **rMCZ 29.2 (Eastern Section)**

attributed to specific sites.

Baseline description of activity	Costs of effect of MCZ on the sector
There are 2 licensed aggregate extraction production areas (Nos. 464/1 and 464/2) within 1km of the rMCZ. It is anticipated that the Environmental Impact Assessment for renewal of this licence will be conducted in 2021(based on information provided by The Crown Estate (pers. comm., 2012).	<table><tr><td>Average annual site-specific costs £m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr><tr><td>Cost to the operator</td><td>0.003</td><td>Assessed for the suite of sites</td></tr></table> ***Scenario 1:*** 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 pMCZ 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. ***Scenario 2:*** An assessment of the additional costs of 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.

Table 2b. Commercial fisheries **rMCZ 29.2, East Meridian (Eastern Side)**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. 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.

Management scenario 1: No additional management.

Management scenario 2: Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (Statutory Nature Conservation Bodies (SNCB)

Table 2b. Commercial fisheries **rMCZ 29.2, East Meridian (Eastern Side)**

informed scenario).

Summary of all fisheries: This rMCZ is an alternative option to rMCZ 29, representing a smaller area that might be more acceptable to stakeholders, but that protects slightly fewer features. The rMCZ is situated in the westbound Channel shipping lane, about half of it is between the 6nm and 12nm limits and half beyond the 12nm limit. Most UK vessels fishing the site are based in Shoreham and Newhaven and comprise of both under 15 metres and over 15 metres in length. For those vessels that carry out scallop dredging and beam trawling, these activities have a high revenue, withabout 40% of their earnings come from scallop dredging within this rMCZ (Regional Stakeholder Group (RSG) meeting, July 2011). This area is heavily fished by large UK scallop dredgers and beam trawlers, and by several vessels under 10 metres. These smaller vessels derive income mainly from scallop dredging followed by set netting and bottom trawling (MCZ Fisheries Model). Many Scottish scallopers land into Shoreham as a result of having been displaced from their northern grounds.

This area is heavily fished by large UK, Dutch, Belgian and French scallop dredgers and beam trawlers. Belgian and French vessels have historical rights to fish between 6nm and 12nm; Dutch vessels fish beyond 12nm. 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: £0.299m/yr.

<table>
<tr><th>Baseline description of UK commercial fisheries</th><th>Costs of impact of rMCZ on UK commercial fisheries</th></tr>
<tr><td>Bottom trawls Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.133m/yr.</td><td>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>0.000</td><td>0.133</td></tr>
</table></td></tr>
<tr><td>Dredges Vessel numbers unknownEstimated total value of landings from the rMCZ: £0.132m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK dredge 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>0.132</td></tr>
</table></td></tr>
<tr><td>Hooks and lines: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.005m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line 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>0.005</td></tr>
</table>
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</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 29.2, East Meridian (Eastern Side)</th></tr>
<tr><td></td><td>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.</td></tr>
<tr><td>Nets Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.025m/yr (MCZ Fisheries Model).</td><td>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>0.025</td></tr>
</table>
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.</td></tr>
<tr><td>Pots and traps: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.004m/yr (MCZ Fisheries Model).</td><td>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>0.004</td></tr>
</table>
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.</td></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td></td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ 29.2, East Meridian (Eastern Side)</th></tr>
<tr><td colspan="2"></td><td>The estimated annual value of UK landings and gross value added (GVA) 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>0.299</td></tr><tr><td>GVA affected</td><td>0.000</td><td>0.134</td></tr></table></td></tr>
<tr><th colspan="2">Baseline description of non-UK fisheries</th><th>Costs of impact of rMCZ on non-UK commercial fisheries</th></tr>
<tr><td colspan="2">The rMCZ is heavily fished by large non-UK scallop dredgers and beam trawlers, and by several non-UK vessels under 10 metres. The smaller vessels derive income mainly from scallop dredging followed by set netting and bottom trawling (RSG Meeting, July 2011). Information on numbers of vessels using the larger rMCZ 29 is provided for that site; it is not known what proportion uses this smaller area.

There is no information on use on numbers of vessels or landings for the Dutch fleet that use this area . The Belgian fleet fishes the area heavily but no details are available.

Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.630m/yr; static gears: <£0.001m/yr; other gears: £0.003 (Direction des Pêches Maritimes et de l' Aquaculture , 2011). Estimates are not available for other countries.</td><td>Scenario 1: No impacts are anticipated under Scenario 1

Scenario 2: Non-UK vessels using static gear and bottom trawls/dredges will be affected by this management scenario for the rMCZ, particularly French vessels. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be: £0.630m/yr (bottom trawls/dreges) and <£0.001m/yr (static gears) (Direction des Pêches Maritimes et de l' Aquaculture, 2011). No information on the effect on other non-UK vessels is available.</td></tr>
</table>

Table 2c: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 29.2, East Meridian (Eastern side)**
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 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)

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 29.2, East Meridian (Eastern Side)**
Cables (existing interconnectors and telecom cables) Commercial fisheries (mid-water trawls) Recreation Shipping	

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 4a. Fish and shellfish for human consumption		**rMCZ 29.2, East Meridian (Eastern Side)**
Baseline	**Beneficial impact**	
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. Circalittoral rock is an important location for commercial inshore fishing activity, particularly for crab and lobster. Subtidal sand and mixed sediment habitats are important nursery areas for many species and thus often important for fisheries (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). The site is heavily fished by large UK scallop dredgers and beam trawlers, and by several under 10 metre vessels that mainly dredge for	If the conservation objectives of the features are achieved, all features will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. 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. Potential benefits may arise on-site, for fishers permitted to fish	Anticipated direction of change:  Confidence: Low

scallops, but also set net and bottom trawl. A description of on-site fishing activity and the value derived from it is set out in Table 2b.	within the rMCZ, and off-site from spill-over benefits.	

Table 4b. Recreation	**rMCZ 29.2, East Meridian (Eastern Side)**	
Baseline	**Beneficial impact**	
Angling: 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. Circalittoral rock habitats support rich biodiversity within the site while subtidal sand and subtidal mixed sediments support 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). 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). The rMCZ is too far offshore for private angling boats, but may be used for fishing by charter vessels on their way over to fish French waters. The potential spawning ground for fish and generally high biodiversity, due to the complex habitats within the site, are likely to help support potential on-site and off-site fisheries. 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 potential spawning and nursery area.	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. 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). 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. 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. The adjacent popular angling spot, the Varne Bank may benefit from possible spill-over effects.	Anticipated direction of change:  Confidence: Low
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A

Table 4b. Recreation		**rMCZ 29.2, East Meridian (Eastern Side)**
Wildlife watching: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. Circalittoral rock habitats, subtidal sand and subtidal mixed sediments support internationally important fish and shellfish fisheries (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). The rMCZ has particularly high biodiversity and abundant fish populations, which potentially support foraging sea birds and marine mammals. It lies within an area of the English Channel used by ferries, which often carry wildlife watchers, particularly those interested in marine mammals. Visitors in transit across the Channel may benefit from any increased biodiversity through more regular sightings of birds and marine mammals. It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	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. 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. 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. 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.	Anticipated direction of change: ⇧ Confidence: Low
Other recreation: Other recreational activities are not known to take place in the rMCZ.	N/A	N/A

Table 4c. Research and education		**rMCZ 29.2, East Meridian (Eastern Side)**
Baseline	**Beneficial impact**	
Research: 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. No known formal research activities are currently carried out in the	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.	Anticipated direction of change: ⇧

Table 4c. Research and education		**rMCZ 29.2, East Meridian (Eastern Side)**
rMCZ. However, ferries crossing the English Channel may be used by marine mammal observers whose data contribute to national databases. It has not been possible to estimate the value derived from research activities associated with the rMCZ.		Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity occurs in the area of the rMCZ.	As the rMCZ is approximately 15km 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 external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ 29.2, East Meridian (Eastern Side)**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste (subtidal sediments and subtidal sands and gravels) and sequestration of carbon (subtidal sediments) (Fletcher and others, 2011). ***Environmental resilience:*** The features of the site are not known to contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** As the site is offshore, its features are not thought to contribute to the delivery of this service. It has not been possible to estimate the value derived from regulating services associated with the rMCZ.	If the conservation objectives of the features are achieved, all of the features will be recovered to favourable condition. 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 of its habitats. 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.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values		rMCZ 29.2, East Meridian (Eastern Side)
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an ecologically coherent network of 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.	Anticipated direction of change: ⇧ Confidence: Moderate

rMCZ 30 Kentish Knock East

Site area (km^2): 96.30

Table 1. Conservation impacts			rMCZ 30, Kentish Knock East	
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) would protect predominantly subtidal coarse sediments and small patches of subtidal sand, and contains moderate species richness in relation to other rMCZs in the region. Persistent thermal fronts and regular summer/winter bird foraging areas highlight the fact that the area has high pelagic biodiversity. The majority of the site's sea bed shows geomorphological evidence of the eastern English Channel outburst flood, which occurred some 200,000 years ago when a huge glacial lake in the North Sea burst through the Dover Straits Isthmus which contained it, thus separating England from mainland Europe. Sonar evidence of the sea bed reveals deeply gouged channels where the floodwaters broke through. This site is in close proximity to the Margate and Long Sands Special Area of Conservation in the north-west and overlaps with the Outer Thames Estuary Special Protection Area. 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**
Broad-scale habitats				
A5.1 Subtidal coarse sediment	81.65	-	Unfavourable condition	Recover to favourable condition
A5.2 Subtidal sand	2.82		Unfavourable condition	Recover to favourable condition
A5.4 Subtidal mixed sediments	11.52		Unfavourable condition	Recover to favourable condition

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

Table 2a. Commercial fisheries — **rMCZ 30, Kentish Knock East**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

The Joint Nature Conservation Committee 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.

Management scenario 1: No additional management (Statutory Nature Conservation Bodies (SNCB) informed scenario).

Management scenario 2: Closure of entire rMCZ to bottom trawls and dredges (SNCB informed scenario)*.
* There is no information to indicate that dredging occurs in this site and so there is no assessment of this gear type below.

Summary of all fisheries: The rMCZ lies mainly between the 6nm limit and 12 nm limit, but extends outside the 12nm limit in the south east. Trawlers from West Mersea, Whitstable, Leigh-on-Sea and Southend work this area including both under 15 metre and over 15m vessels and derive 25% of their earnings from the site (IA questionnaire response from Southend vessel owner, August 2011). Several UK vessels deploy long lines in the area seasonally.. A fishing representative indicated that there are 15 vessels that fish wthin the rMCZ, 5 of which are over 10 metres, the rest under 10 metres (Interview with fisheries representative for this site, July 2011). The French and Belgian fleets have historical fishing rights from 6nm to 12nm, and the Dutch fleet is active beyond the 12nm limit. 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: £0.073m/yr.

Baseline description of UK commercial fisheries	**Costs of impact of rMCZ on UK commercial fisheries**
Bottom trawls: Vessel numbers are unknown.Estimated total value of landings from the rMCZ: £0.024m/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
Value of landings affected	0.000	0.024

Total direct impact on UK commercial fisheries	
	The estimated annual value of UK landings and gross value added (GVA) affected is expected to fall within the following range of scenarios:

<table>
<tr><th colspan="2">Table 2a. Commercial fisheries</th><th>rMCZ 30, Kentish Knock East</th></tr>
<tr><td colspan="2"></td><td>
<table>
<tr><th>£m/yr</th><th>Scenario 1</th><th>Scenario 2</th></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.024</td></tr>
<tr><td>GVA affected</td><td>0.000</td><td>0.010</td></tr>
</table>

A representative of Southend fishermen who was interviewed explained that closure of the entire rMCZ to bottom trawls (under Scenario 2) is expected to affect trawlers in particular from West Mersea, Whitstable, Leigh-on-Sea and Southend (15 trawlers). Displacement is viewed as a non-viable alternative as: (i) all other fishing grounds have existing users and any increased effort within them could lead to conflict; and (ii) all available species are already fished using appropriate gears. Trawlers would experience a major loss of revenue which would force them to leave the fleet (see Annex J3a for more detail). Associated shore-based jobs could be lost and the closure would result in an important social cost to local fishing communities. It will also have indirect impacts on local fish markets, restaurants, fish retailers, and activities linked to the fishing fleet such as repairs, fuel services and gear suppliers (IA questionnaire response from vessel owner representing the Southend Fleet, August 2011).</td></tr>
<tr><th>Baseline description of non-UK fisheries</th><th colspan="2">Costs of impact of rMCZ on non-UK commercial fisheries</th></tr>
<tr><td>Vessels from France: The rMCZ is used by 10–40 French trawlers under 15 metres from the Nord-Pas de Calais and Picardie fleet (from Boulogne-sur-Mer) which target red mullet and squid as they are high-value, non- quota species. (Direction des Pêches Maritimes et de l' Aquaculture, 2011).

Vessels from the Netherlands: the Dutch fleet operate in part of the site using chainless gears to fish for sole (Balanced Seas Final Report, Site Assessment Document).

Vessels from Belgium: vessels traverse the site on the way to other fishing grounds but there is no information as to their fishing activities in the site.</td><td colspan="2">Scenario 1: No impacts are anticipated under Scenario 1

Scenario 2: Non-UK vessels using static gear and bottom trawls/dredges will be affected by this management scenario for the rMCZ, particularly French vessels. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be: £0.012m/yr (bottom trawls/dredges) (Direction des Pêches Maritimes et de l' Aquaculture, 2011). No information on the effect on other non-UK vessels is available.</td></tr>
</table>

Table 2a. Commercial fisheries	**rMCZ 30, Kentish Knock East**
Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.012m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.	

Table 2b. Ports, harbours, shipping and disposal sites — **rMCZ 30, Kentish Knock East**

Source of costs of the recommended Marine Conservation Zone (rMCZ)

Management scenario 1: Not applicable to this site.

Management scenario 2: Increase in costs of assessing environmental impacts for future licence applications. This applies to future licence applications for disposal of dredged material within 5 km of the rMCZ.

Baseline description of activity	**Costs of impact of MCZ on the sector**
Disposal sites: There are two sites (Area 108/3 and NS100 Britned) within 5km of the rMCZ which are licensed for disposal of channel dredge material. The average number of licence applications received for both of these disposal sites is 0.1 per year (based on number of licence applications received between 2001 and 2010 (Cefas, pers. comm., 2011).	*£m/yr* — Scenario 1 — Scenario 2 Cost to the operator — N/A — 0.001 ***Scenario 1:*** Not applicable to this site. ***Scenario 2:*** Future licence applications for disposal of material 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).

Table 2c: Other impacts that are assessed for the suite of MCZs and not for this site alone — **rMCZ 30, Kentish Knock**

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 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)

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 30, Kentish Knock East**
Cables (existing interconnectors and telecom cables) Commercial fisheries (hooks and lines, mid-water trawls, nets, pots and traps) Recreation Shipping	

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 4a. Fish and shellfish for human consumption		**rMCZ 30, Kentish Knock East**
Baseline	**Beneficial impact**	
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. Subtidal coarse sediment, sand, and mixed sediment habitats are important nursery areas for many species and thus often important for fisheries (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). Trawlers from West Mersea, Whitstable, Leigh-on-Sea and Southend fish within this area and derive 25% of their earnings from this site (Impact Assessment questionnaire response from Southend vessel	If the conservation objectives of the features are achieved, all 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, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. 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. Potential benefits may arise on-site, for fishers permitted to fish	Anticipated direction of change:  Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ 30, Kentish Knock East**
owner, August 2011). Several UK vessels deploy long lines in the area seasonally. A description of on-site fishing activity and the value derived from it is set out in Table 2a.	within the rMCZ, and off-site from spill-over benefits.	

Table 4b. Recreation		**rMCZ 30, Kentish Knock East**
Baseline	**Beneficial impact**	
Angling: 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. Subtidal mixed sediment, subtidal sand and subtidal coarse sediments support high biodiversity within the site, providing 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). 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). The rMCZ is too far offshore for private angling boats, but may be used for fishing by charter vessels from Mersea, Felixstowe, Ramsgate and Harwich. The potential spawning ground for fish and generally high biodiversity, due to the complex habitats within the site, are likely to help support potential on-site and off-site fisheries. 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 potential spawning and nursery area.	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. 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). 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. 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.	Anticipated direction of change: ⇧ Confidence: Low
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A

Table 4b. Recreation		**rMCZ 30, Kentish Knock East**
Wildlife watching: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. Subtidal mixed sediment, subtidal sand and subtidal coarse sediments support internationally important fish and shellfish fisheries (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). Due to its offshore location, the rMCZ has not been identified as a popular area for wildlife watching. However, the site has particularly high biodiversity and abundant fish populations, which support a number of foraging sea birds including the red throated diver and potentially marine mammals. It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	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. 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. 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. 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.	Anticipated direction of change: ⇧ Confidence: Low
Other recreation: Other recreational activities are not known to take place in the rMCZ.	N/A	N/A

Table 4c. Research and education		**rMCZ 30, Kentish Knock East**
Baseline	**Beneficial impact**	
Research: 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. No known formal research activities are currently carried out in the rMCZ. However, ferries crossing the English Channel are often utilised by marine mammal observers whose data contribute to national	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.	Anticipated direction of change: ⇧ Confidence: High

Table 4c. Research and education		**rMCZ 30, Kentish Knock East**
databases. It has not been possible to estimate the value derived from research activities associated with the rMCZ.		
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity occurs in the rMCZ.	As the rMCZ is approximately 34km 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 external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change: ⇧ Confidence: Low

Table 4d. Regulating services		**rMCZ 30, Kentish Knock East**
Baseline	**Beneficial impact**	
Regulation of pollution: The features (subtidal sediments) of the site contribute to the sequestration of carbon (Fletcher and others, 2011). ***Environmental resilience:*** The features of the site are not known to contribute to the resilience and continued regeneration of marine ecosystems. ***Natural hazard protection:*** As the site is offshore, its features are not thought to contribute to the delivery of this service. It has not been possible to estimate the value derived from regulating services associated with the rMCZ.	If the conservation objectives of the features are achieved, all of the features will be recovered to favourable condition. 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 of its habitats. 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.	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values		**rMCZ 30, Kentish Knock East**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an ecologically coherent network of 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.	Anticipated direction of change:  Confidence: Moderate

rMCZ 31 Inner Bank (rMCZ No 31) Site area (km^2): 199.03

Table 1. Conservation impacts				rMCZ 31, Inner Bank
1a. Ecological description				
This recommended Marine Conservation Zone (rMCZ) would protect moderate energy circalittoral rock which is fully exposed from the surrounding subtidal sand. This rock exposure forms the end of the Palaeochannel, the geological remnant of an ancient river system, and is surrounded by a number of finer-scale habitats, including part of the deeper sand of the Palaeovalley itself. The area is in the top 25% richest areas for benthic species in the Balanced Seas Project Area and the northern edge of the site demonstrates relatively high pelagic biodiversity. This site is not associated with any existing designation. 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**
Broad-scale habitats				
A5.1 Subtidal coarse sediment	2.96	-	Unfavourable condition	Recover to favourable condition
A3.2 Moderate energy infralittoral rock	-	-	Unfavourable condition	Recover to favourable condition
A4.2 Moderate energy circalittoral rock	96.45	-	Unfavourable condition	Recover to favourable condition
A5.2 Subtidal sand	79.78		Unfavourable condition	Recover to favourable condition
Habitats of conservation importance				
Native Oyster beds	-	1 record	Unfavourable condition	Recover to favourable condition
Species of conservation importance				
Native Oyster (*Ostrea edulis*)	-	1 record	Unfavourable condition	Recover to favourable condition

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

Table 2a. Archaeological heritage	rMCZ 31, Inner Bank
Source of costs of the recommended Marine Conservation Zone (rMCZ)	
Increase in costs of assessing environmental impacts for future licence applications (it is not anticipated that any additional mitigation of impacts on features protected by the MCZ will be needed relative to the mitigation provided in the baseline). Archaeological excavations, surface recovery, intrusive and non-intrusive surveys, diver trails and visitors will be allowed.	

Table 2a. Archaeological heritage	**rMCZ 31, Inner Bank**
Baseline description of activity	**Costs of impact of MCZ on the sector**
Wrecked vessels of British origin are recorded in the site as well as several unidentified seabed obstructions. There is one wreck in the site (the *HR Submarine A1*) that is protected under the Protection of Wrecks Act 1973 by a 300m exclusion zone. Since 2003, one survey licence has been granted each year for the *HR Submarine A1* wreck (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 of one licence application could be in the region of £500–£10,000 depending on the size of the MCZ (English Heritage, pers. comm., 2012). No further impacts on activities related to archaeology are anticipated.

Table 2b. Commercial fisheries	**rMCZ 31, Inner Bank**
Source of costs of the recommended Marine Conservation Zone (rMCZ)	
The Joint Nature Conservation Committee and Natural England have advised that there is considerable uncertainty about whether additional management of commercial fishing gears will be required for certain features protected by this rMCZ. 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.	
Management scenario 1: No additional management (Statutory Nature Conservation Bodies (SNCB) informed scenario).	
Management scenario 2: Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (SNCB informed scenario).	
Summary of all fisheries: This site lies mainly between 6nm and 12nm but straddles the 12nm limit in the south west; the north-east corner extends inside the 6nm limit. The area is fished heavily by UK fleets, by about 40–50 vessels including both under 15 metre and over 15 metre vessels (Regional Stakeholder Group (RSG) meeting, August 2011). Trawling takes place mainly in the northern part of the site and scalloping in the southern part. This area is important to under 15 metre UK vessels based at ports between Shoreham and Dungeness for set netting, scallop dredging and bottom trawling (MCZ Fisheries Model). There is a seasonal high intensity of static netting by under-10-metre vessels in the north-east part of the site on the Bullock Bank. 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. The French and Belgian fleets have historical rights between 6nm and 12nm, and the Dutch fleet is active beyond the 12nm limit. Estimated annual value of landings from the rMCZ: £0.389m/yr.	

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries rMCZ 31, Inner Bank</th></tr>
<tr><th>Baseline description of UK commercial fisheries</th><th>Costs of impact of rMCZ on UK commercial fisheries</th></tr>
<tr><td>Bottom trawls: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.106m/yr (MCZ Fisheries Model).</td><td>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>0.000</td><td>0.106</td></tr></table></td></tr>
<tr><td>Dredges: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.143m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK dredge 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>0.143</td></tr></table></td></tr>
<tr><td>Hooks and lines: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.001m/yr.</td><td>The estimated annual value of UK hook and line 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>0.001</td></tr></table>In establishing the draft conservation objectives, the site 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 'recover' conservation objectives. As such, it is anticipated that, if management is required, it may be towards the lower end of the range, and is likely to be less restrictive than that required for other gears.</td></tr>
<tr><td>Nets: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.131m/yr (MCZ Fisheries Model).</td><td>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>0.131</td></tr></table>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.</td></tr>
<tr><td>Pots and traps: Vessel numbers unknown.Estimated total value of landings from the rMCZ: £0.008m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK pot and trap landings affected is expected to fall within the following range of scenarios:</td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries</th><th>rMCZ 31, Inner Bank</th></tr>
<tr><td colspan="2"></td><td>
<table>
<tr><td>£m/yr</td><td>Scenario 1</td><td>Scenario 2</td></tr>
<tr><td>Value of landings affected</td><td>0.000</td><td>0.008</td></tr>
</table>
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(s). 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.
</td></tr>
<tr><td colspan="2">Total direct impact on UK commercial fisheries</td><td></td></tr>
<tr><td colspan="2"></td><td>The estimated annual value of UK landings and gross value added (GVA) 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>0.389</td></tr>
<tr><td>GVA affected</td><td>0.000</td><td>0.175</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Baseline description of non-UK fisheries</td><td>Costs of impact of rMCZ on non-UK commercial fisheries</td></tr>
<tr><td colspan="2">The rMCZ is a key fishing ground for French trawlers and scallop dredgers:
• Nord-Pas de Calais and Picardie fleet: 40–45 vessels from Boulogne-sur-Mer and Dunkirk; vessels also target red mullet and squid as they are high-value, non-quota species (Direction des Pêches Maritimes et de l' Aquaculture, 2011).
• Haute Normandie fleet: 12 vessels targeting scallop, Dover sole and bass.
Estimated value of landings from the rMCZ by French vessels: bottom trawls/dredges: £0.147m/yr; static gear: £0.001m/yr (Direction des Pêches Maritimes et de l' Aquaculture, 2011). Estimates are not available for other countries.</td><td>Scenario 1: No impacts are anticipated under Scenario 1.

Scenario 2: Non-UK vessels using static gear and bottom trawls/dredges will be affected by this scenario for the rMCZ, particularly French vessels. In the event of a full closure of the rMCZ, the estimated value of French landings affected will be: £0.147m/yr (bottom trawls/dreges) and £0.001m/yr (static gear) (Direction des Pêches Maritimes et de l' Aquaculture, 2011). No information on the effect on other non-UK vessels is available.</td></tr>
</table>

Table 2c: Other impacts that are assessed for the suite of MCZs and not for this site alone	**rMCZ 31, Inner Bank**
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 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)

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 31, Inner Bank**
Cables (existing interconnectors and telecom cables) Commercial fisheries (mid-water trawls) Recreation Shipping	

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 4a. Fish and shellfish for human consumption		**rMCZ 31, Inner Bank**
Baseline	**Beneficial impact**	
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. Infralittoral and circalittoral rock are important locations for commercial inshore fishing activity, particularly for crab and lobster. Subtidal sand and coarse sediment habitats are important nursery areas for many species and thus often important for fisheries (Fletcher and others, 2011). The baseline quantity and quality of the ecosystem service provided is	If the conservation objectives of the features are achieved, all features will be recovered to favourable condition. New management of fishing activities is expected (above the baseline situation), the costs of which are set out in Table 2b, which may reduce the impacts on fish and shellfish habitats and harvesting of stocks. 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)	Anticipated direction of change: ⇧ Confidence: Low

Table 4a. Fish and shellfish for human consumption		**rMCZ 31, Inner Bank**
assumed to be commensurate with that provided by the features of the site when in unfavourable condition (see Table 1 for details). Trawling takes place mainly in the northern part of the site and scalloping in the southern part; there is also seasonal high-intensity static netting by under 10 metre vessels in the north-east part of the site, on the Bullock Bank. A description of on-site fishing activity and the value derived from it is set out in Table 2b.	harvesting will be enough to have any significant 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.	

Table 4b. Recreation		**rMCZ 31, Inner Bank**
Baseline	**Beneficial impact**	
Angling: 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. Infralittoral and circalittoral rock habitats support rich biodiversity within the site while subtidal sand and subtidal coarse sediments support 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). 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). The rMCZ is too far offshore for private angling boats, but may be used for fishing by charter vessels on their way over to fish French waters. The potential spawning ground for fish and generally high biodiversity, due to the complex habitats within the site, are likely to help support potential on-site and off-site fisheries.	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. 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). 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. 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.	Anticipated direction of change:  Confidence: Low

Table 4b. Recreation		**rMCZ 31, Inner Bank**
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 potential spawning and nursery area.		
Diving: Diving is not known to take place in the rMCZ.	N/A	N/A
Wildlife watching: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of recreation and tourism services. Infralittoral rock, circalittoral rock, subtidal sand and subtidal coarse sediments support internationally important fish and shellfish fisheries (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). The rMCZ has particularly high biodiversity and abundant fish populations which potentially support foraging sea birds and marine mammals. It lies within an area of the English Channel used by ferries, which often carry wildlife watchers, particularly those interested in marine mammals. Visitors in transit across the Channel may benefit from any increased biodiversity through more regular sightings of birds and marine mammals. It has not been possible to estimate the value derived from wildlife watching in the rMCZ.	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. 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. 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. 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.	Anticipated direction of change: Confidence: Low
Other recreation: Other recreational activities are not known to take place in the rMCZ.	N/A	N/A

Table 4c. Research and education		**rMCZ 31, Inner Bank**
Baseline	**Beneficial impact**	

Table 4c. Research and education		**rMCZ 31, Inner Bank**
Research: 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. No known formal research activities are currently carried out in the rMCZ. However, ferries crossing the English Channel are often utilised by marine mammal observers, whose data contribute to national databases. It has not been possible to estimate the value derived from research activities associated with the rMCZ.	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.	Anticipated direction of change:  Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ can contribute to the delivery of education services. No known education activity occurs in this rMCZ.	As the rMCZ is approximately 10km 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 external education programmes (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Anticipated direction of change:  Confidence: Low

Table 4d. Regulating services		**rMCZ 31, Inner Bank**
Baseline	**Beneficial impact**	
Regulation of pollution: The features of the site contribute to the bioremediation of waste (Native oyster beds) and sequestration of carbon (Native oyster beds and subtidal sediments) (Fletcher and others, 2011). ***Environmental resilience:*** The features of the site (Native oyster beds) contribute to the resilience and continued regeneration of marine ecosystems (Fletcher and others, 2011). ***Natural hazard protection:*** As the site is offshore, its features are not	If the conservation objectives of the features are achieved, all of the features will be recovered to favourable condition. 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 of its habitats. Designating the rMCZ will protect its features and the ecosystem services that they provide against the risk of future degradation	Anticipated direction of change:  Confidence: Low

thought to contribute to the delivery of this service. It has not been possible to estimate the value derived from regulating services associated with the rMCZ.	from pressures caused by human activities.	

Table 4e. Non-use and option values		**rMCZ 31, Inner Bank**
Baseline	**Beneficial impact**	
Some people gain satisfaction from the existence of marine habitats, species and other features. They also gain from having the option to benefit in the future from the habitats and species in the rMCZ and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option value services associated with the rMCZ.	The rMCZ will benefit the proportion of the UK population that values conservation of the rMCZ features and its contribution to an ecologically coherent network of 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.	Anticipated direction of change: ⇧ Confidence: Moderate

Reference Area 18 St Catherine's Point West — Site area (km^2): 13.81

Table 1. Conservation impacts — **rMCZ Reference Area 18 St Catherine's Point West**

1a. Ecological description

This recommended Marine Conservation Zone (rMCZ) Reference Area lies off the south-west coast of the Isle of Wight, extending from 150 metres offshore to the seaward boundary of the South Wight Maritime Special Area of Conservation (SAC). The area contains four rock and sediment broad-scale habitats, covering the infralittoral and circalittoral zones and including the entire range of energy levels, a combination which occurs only in one other place in the Balanced Seas Project Area, the Dover Straits. St Catherine's Point is at the transition zone between warmer south-western and colder North Sea waters, where several species reach their eastern limit of distribution along the English Channel (Natural England, 2001). The suite of infralittoral rocks and other broad-scale habitats here support a rich and diverse community of flora and fauna. Kelp forests and subtidal faunal turf communities (highly diverse assemblages of attached animals growing on subtidal hard substrata), ranging from low encrusting forms, such as sea mats and sponges, to tall erect forms, such as soft corals and sea fans, occur within the shallower subtidal area of the site. Beneath the canopy of the kelp forests, subtidal red algal communities flourish in water depths that brown and green algae cannot tolerate. These communities also include prominent mobile organisms associated with the attached fauna, such as decapod crustaceans, echinoderms, molluscs and fish. This site lies within the South Wight Maritime SAC. 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				
A3.1 High energy infralittoral rock	2.11	-	Unfavourable condition	Recover to reference condition
A3.2 Moderate energy infralittoral rock	6.03		Unfavourable condition	Recover to reference condition
A3.3 Low energy infralittoral rock	3.73		Unfavourable condition	Recover to reference condition
A4.1 High energy circalittoral rock	0.94		Unfavourable condition	Recover to reference condition
A4.2 Moderate energy circalittoral rock	0.52		Unfavourable condition	Recover to reference condition
A5.4 Subtidal mixed sediments	0.51		Unfavourable condition	Recover to reference condition
Habitats of Conservation Importance				
Subtidal sands and gravels	2.11	-	Unfavourable condition	Recover to reference condition

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

Table 2a. Archaeological heritage	**Reference Area 18, St Catherine's Point West**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Increase in costs of assessing environmental impacts for future licence applications. Archaeological excavations, surface recovery and intrusive surveys will be prohibited from the entire site. Diver trails, visitors and non-intrusive surveys will be allowed.	
Baseline description of activity	**Costs of impact of MCZ on the sector**
Vessel wrecks of British, French, Dutch and Belgian origin are recorded in the site, as well as one British World War II Spitfire (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–£10,000 depending 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 Impact Assessment (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.

Table 2b. Commercial fisheries	**Reference Area 18, St Catherine's Point West**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area Closure of entire site to all gear types.	
Summary of all fisheries: The rMCZ Reference Area lies 150 metres offshore, within the 6nm limit and within the South Wight Maritime Special Area of Conservation (SAC). It is a major potting and netting (static gear) fishing ground. Vessels from across the Solent and Isle of Wight all use the area heavily. The area is worked for most of the year and is one of the main potting areas (for crabs) around the Isle of Wight. At least 1,000 pots are laid down the slope of the seabed within the site at depths of 18-50 metres (Impact Assessment (IA) questionnaire responses from Isle of Wight vessel owners, August 2011) and the site provides a staple fishing ground for vessels from Bembridge, Freshwater, Ventnor, Yarmouth and a larger vessel from Lymington (IA questionnaire responses from Isle of Wight vessel owners, August 2011). Several fishing businesses earn the majority of their income from this site including 1 fisher who has fished in the site for 47 years and obtains 95% of his earnings from the area; 1 fisher based in Yarmouth who earns 90% of his revenue from the site; and 1 fisher based in Ventnor who earns 70% of his revenue from this site (IA questionnaire response from Isle of Wight vessel owners, August 2011). More detail	

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries Reference Area 18, St Catherine's Point West</th></tr>
<tr><td colspan="2">on the approach used for the fisheries method is provided at Annexes H7 and N4.

Estimated annual value of landings from the rMCZ RA: £0.016m/yr.
(Due to resolution issues of the MCZ Fisheries Model and the small size of many rMCZ Reference Areas in the Balanced Seas region, some fisheries landings values may be inaccurate. They have been included as a precautionary measure and to avoid underestimating the economic impact of a site.)</td></tr>
<tr><th>Baseline description of UK commercial fisheries</th><th>Costs of impact of rMCZ on UK commercial fisheries</th></tr>
<tr><td>Bottom trawls: Fishers operating at least 2 vessels indicated that their areas of operation overlapped with the rMCZ RA (FisherMap Data 2010). The vessels target Dover sole using trawls and beam trawls. In both cases, the rMCZ Reference Area only represents a small proportion of the businesses' areas of operation.

Estimated value of UK bottom trawl landings from the rMCZ Reference Area: £0.001m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK bottom trawl landings affected:<table><tr><td>£m/yr</td><td></td></tr><tr><td>Value of landings affected</td><td>0.001</td></tr></table></td></tr>
<tr><td>Hooks and lines: Fishers operating at least 4 vessels (1 from Hardway Fishermen's Association, 1 from the Isle of Wight Commercial Fishermen's Association, 2 unaffiliated to a fishing association) who use rod and lines indicated that their areas of operation overlap with the rMCZ Reference Area (FisherMap Data 2010). They target bass and mackerel. In one case, there is appreciable overlap between the rMCZ Reference Area and the business's area of operation.

Estimated value of UK hook and line landings from the rMCZ Reference Area: £ 320/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK hook and line landings affected is expected to fall within the following range of scenarios:<table><tr><td>£m/yr</td><td></td></tr><tr><td>Value of landings affected</td><td><0.001*</td></tr></table>*£320/yr</td></tr>
<tr><td>Nets: Four stakeholders who were interviewed (no fishing association affiliations given) indicated that their areas of operation overlap with the rMCZ RA (FisherMap 2010). They target bass, Dover sole and European eel using drift, gill and fixed nets. In two cases, there is an appreciable overlap between the businesses' areas of operation and the rMCZ RA.

Estimated value of UK net landings from the rMCZ RA: £0.003m/yr (MCZ</td><td>The estimated annual value of UK net landings affected:<table><tr><td>£m/yr</td><td></td></tr><tr><td>Value of landings affected</td><td>0.003</td></tr></table></td></tr>
</table>

<table>
<tr><th colspan="2">Table 2b. Commercial fisheries Reference Area 18, St Catherine's Point West</th></tr>
<tr><td>Fisheries Model).</td><td></td></tr>
<tr><td>Pots and traps: Eight stakeholders who were interviewed (from Hardway Fishermen's Association, Isle of Wight Commercial Fishermen's Association and unaffiliated) indicated that the rMCZ Reference Area overlapped with their areas of operation, where they target whelks and common lobsters (FisherMap 2010). Brown crabs and edible crabs are also recorded as a main target species in this area (Southern Inshore Fisheries and Conservation Authority (IFCA), pers. comm., 2012).

Estimated value of UK pot and trap landings from the rMCZ RA: £0.012m/yr (MCZ Fisheries Model).</td><td>The estimated annual value of UK pots and trap landings affected:<table><tr><td>£m/yr</td><td></td></tr><tr><td>Value of landings affected</td><td>0.012</td></tr></table></td></tr>
<tr><td>Total direct impact on UK commercial fisheries</td><td></td></tr>
<tr><td></td><td>The estimated annual value of UK landings and gross value added (GVA) affected:<table><tr><td>£m/yr</td><td></td></tr><tr><td>Value of landings affected</td><td>0.016</td></tr><tr><td>GVA affected</td><td>0.008</td></tr></table>Local fishery representatives indicated that restrictions on commercial fishing, particularly potting, in this rMCZ Reference Area are expected to have a considerable impact on the Isle of Wight fleets (interviews with four Isle of Wight vessel owners, August 2011). Displacement was not thought to be a viable option by stakeholders (see Annex J3a for more detail) due to:
the size and range of the vessels currently working the area;
maximum capacity having been reached in other nearby potting grounds;
wind farms and marine aggregate dredging around the island reducing the amount of seabed available for static gear;
increased costs of fuel. Currently, fuel consumption is low due to the proximity of the grounds to vessel bases.
The 4 Isle of Wight vessel owners who were interviewed (25-27 August 2011)</td></tr>
</table>

Table 2b. Commercial fisheries	**Reference Area 18, St Catherine's Point West**
	indicated that, as a result of the closure, at least 10 vessels will either leave the industry or try to work other areas where gear conflict will be inevitable and the fishers will experience a reduction in quality and quantity of catch. The vessel owners predicted that supplies to regional and national shellfish markets would be affected as a result of the closure, as well as supplies to markets in France and Spain and the newly developing market in China for autumn crab with coral. The 4 Isle of Wight vessel owners who were interviewed (25-27 August 2011) indicated that at least two businesses that rely on this area for income and employ people from the island (one business employs 12 people directly and 10 boat crews and the other employs 12 people directly) will be affected by the closure as well as the many restaurants, retailers and other seafood outlets that are supplied by these businesses. A Bembridge fisher who uses the area employs his family and 16 other people directly as part of his crab dressing business. Other businesses that would be affected include gear suppliers, chandlers, bait suppliers, fuel suppliers, mooring authorities, fish retail outlets in Bembridge, Freshwater and Lymington, local pubs, restaurants, stalls and the tourist industry (IA questionnaire response from Isle of Wight vessel owners, 25-27August 2011).
Baseline description of non-UK fisheries	**Costs of impact of rMCZ on non-UK commercial fisheries**
	None.

Table 2c. National defence	**Reference Area 18, St Catherine's Point West**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area	
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.	
Baseline description of activity	**Costs of impact of MCZ on the sector**
The entire rMCZ RA is covered by national defence covering the air, water column and seabed. The main impacts on the rMCZ RA are (a) air and	It is not known whether this rMCZ RA will impact on the MOD's use of the site. Impacts of rMCZs on national defence are assessed in Annex H10 and N9

water surface – noise, physical and visual disturbance; (b) water column noise; and (c) seabed – fixed equipment, extraction and physical disturbance.	(they are not assessed for this site alone).

Table 2d. Recreational anchoring	**Reference Area 18, St Catherine's Point West**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area	
Closure of entire site to all recreational anchoring (except in emergency circumstances).	
Baseline description of activity	**Costs of impact of MCZ on the sector**
The Solent Local Group representative for the Royal Yachting Association considers that anchoring is minimal within the site (John Pockett, email 14th November 2011). and both he and a local commercial fisher based in Ventnor have said that no recreational vessels have been seen anchoring in the rMCZ Reference Area during the Round the Island Race which attracts thousands of boats every year and which is the key period when anchoring would occur(Geoff Blake via John Pockett, email, 14th November 2011) However, Royal Lymington Yacht Club stated that many boats taking part in the Round the Island Race and other races anchor on the eastern end of this rMCZ Reference Area when the tide turns against them. (RYA BS IA 2nd Tranche Feedback, February, 2012). 49 StakMap interviewees (representing clubs throughout southern England and a combined total of 14,012 people/yr) indicated that yachting interests overlap with the rMCZ RA, with nine interviewees saying that the area was used more than once a week. However, only one interviewee (representing 240 people/yr) indicated that the area they use for anchoring (the whole of the western Channel and Solent) overlapped with the rMCZ Reference Area. Levels of recreational sea angling and charter boat activity in this rMCZ Reference Area are high at certain times of year and these vessels are known to anchor here (Regional Stakeholder Group (RSG) meeting, August 2011), especially during the summer (A. Savage, Solent/IOW/Hants Local	It is anticipated that recreational sailing vessel users will respond to the closure by anchoring in alternative areas to the east, outside the Reference Area. During most of the year relatively few vessel users will be impacted on, though the number of vessel users affected will be higher during certain conditions a few times a year during races. It is not anticipated that the closure will result in significant costs to recreational vessel users who are not angling. Impacts on recreational angling are considred in Table 2e.

Table 2d. Recreational anchoring	**Reference Area 18, St Catherine's Point West**
Group charter boat representative, pers.comm., January 2012)	

Table 2e. Recreational angling	**Reference Area 18, St Catherine's Point West**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area	
Closure of the entire site to all recreational angling.	
Description of activity and its impact on interest features	**Costs of effect of rMCZ on the sector**
Eighteen StakMap interviews indicate that areas used for recreational angling overlapped with the rMCZ Reference Area. Two interviews were with private boat fishing clubs (235 people/yr), and 16 were with charter boat operators representing 3,185 anglers/yr. Local Group discussions confirmed that there is a high intensity of private boat and charter boat use of the rMCZ Reference Area at certain times of year (Solent Sites Meeting, July 2011). There may be up to 24 private angling boats within the rMCZ Reference Area at any given time, depending on the season (Williams, T., Isle of Wight Angling Intensity Report, December 2010). The site is heavily used by about 25 charter vessels from Lymington, Keyhaven and Yarmouth and some from Portsmouth and Langstone Harbour. It is estimated that these each fish in the site for 40 days per year with revenue of £385 per vessel per day. In addition, vessels from Weymouth in the Finding Sanctuary MCZ Project Area travel to fish in this site (A. Savage, Solent/IOW/Hants Local Group charter boat representative, pers. comm., January 2012). Shore angling does not take place in the site as the landward boundary of the rMCZ Reference Area is 150 metres offshore.	Anglers may respond to the closure to angling by angling in other areas, though there are no alternative sites nearby that offer comparable fishing marks and high quality of fishing (A. Savage, Solent/IOW/Hants Local Group charter boat representative, pers comms., January 2012). They will incur increased travel costs to travel to other grounds (and increased greenhouse gas emissions will result from the increased travel). It is anticpated that the closure will impact significantly on Solent and Isle of Wight-based private sea anglers (Balanced Seas Solent/IOW/Hants Sites Meeting Report and RSG Meeting Report, July 2011). Angling charter boat operators who use the site are likely to incur a substantial reduction in earnings as a result of the closure. To avoid underestimation of costs, it is assumed that all revenue to charter boat operators from trips that visit the rMCZ RA is lost as a result of the closure. The cost is estimated based on the assumption that each of the 25 operators fish for 40 days/yr in the rMCZ Reference Area, with revenue of £385 per vessel per day. These trips may represent 20% of the total annual turnover of the individual operator (A. Savage, Solent/IOW/Hants Local Group charter boat representative, pers. comm., 2012). This estimate is only for vessels based in the project region. It underestimates the loss of revenue to all charter boats that use the site. *£m/yr* — Scenario 1 Estimated value of charter boat revenue affected — 0.385 GVA affected — 0.165

Table 2f. Renewable energy – tidal energy	**Reference Area 18, St Catherine's Point West**
Source of costs of the recommended Marine Conservation Zone (rMCZ) Reference Area (RA): Installation of devices and cables not permitted within the rMCZ. Increase in costs of assessing environmental impacts for licence applications within 1km of the rMCZ. It is not anticipated that any additional mitigation of impacts on features protected by the rMCZ will be needed relative to the mitigation provided in the baseline.	
Baseline description of activity	**Costs of impact of rMCZ on the sector**
There is potential for future developments that generate electricity using the tidal energy resource in this rMCZ Reference Area as it overlaps with approximately 4km^2 of the Solent Energy offshore deployment site. This is part of the tidal energy project implemented by the Solent Ocean Energy Centre (SOEC), longer-term development of which will take place in 2020–25. SOEC has a plan for an installed capacity of 21MW around the Isle of Wight (J. Fawcett, e-mail 7 March 2012). The Isle of Wight Council has indicated that this is one of the few areas in the UK where tidal energy technology could be implemented. It is assumed, for the purposes of the analysis, that licence applications for the development will be submitted between 2010–15 and 2020–25 (Department of Energy and Climate Change (DECC), pers. comm., 2012).	The rMCZ Reference Area would be closed to tidal energy development because it involves deposition of cables and devices. It is not known whether either of these would be proposed in the site in the absence of the MCZ and what if any mitigation of impacts on MCZ features would be required. The impacts have not been estimated but could be potentially significant. Costs of mitigation could arise from siting devices and cables to avoid the rMCZ Reference Area, from mitigation of impacts of cable protection and, if necessary, from a reduction in the number of devices installed as a result of the rMCZ Reference Area. It is estimated that cables cost £1.010m/km/cable (average of estimates provided by four developers) and that use of frond mattressing to mitigate impacts of cable protection costs £1.000m/km more than the cable protection that would be used in the absence of the rMCZ. It may be that part of the deployment site would be excluded from development as a result of the rMCZ Reference Area. The rMCZ Reference Area could also increase the costs of assessing environmental impacts for future licence applications for the development. It is assumed, for the purposes of the analysis, that additional one-off costs for future licence applications will be incurred, one in in 2015 and the other in 2020 each for an individual cost of £0.014m (based on, per broad-scale habitat assessed, 6 days of a consultant's time at £700/day + 1 day for legal review at £800/day). The total cost for two licence applications will therefore be £0.028m with a present value of £0.024m. ***Concerns raised by stakeholders:***

Table 2f. Renewable energy – tidal energy	**Reference Area 18, St Catherine's Point West**
	The industry has not been able to provide further details of estimated costs of impact (which it anticipates may arise in undertaking monitoring, avoiding impacts on sensitive features, for cable protection, repowering and recommissioning) since tidal energy is still a very new industry and there are many unknown contributing factors (Fawcett, J, tidal energy lead for the Isle of Wight Council, email., 7 March 2012). Designation of this rMCZ Reference Area may deter potential developers from taking forward a commercial-scale project and therefore local impacts on the Isle of Wight economy, aspirations to be a green island and the wider environmental impacts on carbon emissions should also be considered (Merry, S., email, feedback response to first tranche of IA material, 13 January 2012).). It may be that closure of the rMCZ Reference Area to development would make any proposed tidal energy development no longer financially viable. The cost to the operator would be significant and would include loss of sunk investment in development of the site. The costs to the economy (the focus of this Impact Assessment) would be the increased costs of installing the development at an alternative location which, it is assumed would be at increased cost, though the magnitude of these costs is not known. Assuming that the alternative location is not in the vicinity, this would impact on local businesses that would have provided goods and services for the development, thereby affecting the local economy. As SOEC is conceived as a test and demonstration facility for tidal energy devices, the rMCZ Reference Area may delay the development and demonstration of devices (Fawcett. J tidal energy lead for the Isle of Wight Council, email, 7 March 2012).

Table 2g: Other impacts that are assessed for the suite of MCZs and not for this site alone	**Reference Area 18 St Catherine's Point**
Oil and gas related activities (including carbon capture and storage)	
This rMCZ Reference Area overlaps with an area that has potential for future oil and gas exploration and production (it overlaps licensed blocks in the 27th Seaward Licensing Rounds). However, it is unlikely that any oil and gas (including carbon capture and storage) infrastructure will be proposed in future in this	

Table 2g: Other impacts that are assessed for the suite of MCZs and not for this site alone	Reference Area 18 St Catherine's Point
rMCZ Reference Area due to its location and size (DECC, pers. comm., 2012). Impacts of rMCZ Reference Areas 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)

Table 3. Human activities in the site that are not negatively affected by the MCZ (existing activities at their current levels and future proposals known to the regional MCZ projects)	Reference Area 18, St Catherine's Point West
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).

Anticipated benefits to ecosystem services

The habitats, species and other ecological features of the recommended Marine Conservation Zone (rMCZ) Reference Area contribute to the delivery of a range of ecosystem services. Designation of the rMCZ Reference Area 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 Reference Area. Further discussion on the potential benefits to ecosystem services can be found in Annex L and definitions in Annex H.

Table 4a. Fish and shellfish for human consumption	rMCZ Reference Area 18 St Catherine's Point West
Baseline	**Beneficial impact**

Table 4a. Fish and shellfish for human consumption	**rMCZ Reference Area 18 St Catherine's Point West**	
Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption. Infralittoral and circalittoral rock are the predominant habitats in the rMCZ Reference Area, providing a firm substrate for species attachment and a key habitat for inshore crab and lobster fisheries (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 not in reference condition. Brown (edible) crab *Cancer pagurus* is the commercially targeted species. A description of the on-site fisheries and their value is given in Table 2b.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Additional management (above that in the baseline situation) of fishing activities is expected which will prohibit fishing within the rMCZ Reference Area. The costs of this are set out in Table 2b. Achievement of the conservation objectives may improve the contribution of the habitats to the provision of fish and shellfish for human consumption. Management of fishing activity within the rMCZ Reference Area will reduce the on-site fishing mortality of species which may benefit commercial stocks. As no fishing will be permitted within the rMCZ Reference Area, no on-site benefits will be realised. Low mobility and site-attached species populations, such as crab and lobster, may improve as a result of reduced fishing pressure. Localised beneficial spill-over effects may occur around the rMCZ Reference Area.	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ Reference Area 18 St Catherine's Point West**	
Baseline	**Beneficial impact**	
Angling: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of fish and shellfish for human consumption and recreation services. The baseline quantity and quality of the ecosystem service provided is assumed to be commensurate with that provided by features of the site when not in reference condition.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of habitats may have benefits for fish populations. It is unclear whether any benefits for fish populations would arise as a result of reduced fishing mortality due to management of commercial fishing (see Table 4a). As angling will not be permitted within the rMCZ Reference Area,	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ Reference Area 18 St Catherine's Point West**	
Infralittoral and circalittoral rock are the predominant habitats in the rMCZ Reference Area, and provide a firm substrate for species attachment and habitat for crabs and lobsters (Fletcher and others, 2011). The high biodiversity of the area supports mobile fish species of value to recreational fisheries. Angling is an important activity in this rMCZ Reference Area and a description of this activity is set out in Table 2e. It has not been possible to estimate the value derived from angling at the site.	any benefits will be limited to those occurring as a result of spill-over effects of finfish species targeted by anglers outside the rMCZ Reference Area. Such benefits may be insignificant.	
Diving: Diving takes place in the site, predominantly on the wrecks.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. The recovery of the features to reference condition may improve their functioning as support for fish and other marine wildlife (including increases in size and diversity of species) potentially benefiting diving within the rMCZ Reference Area. Any increase may represent a redistribution of dive location preferences rather than an overall increase in diving.	Anticipated direction of change: ⇧ Confidence: Low
Wildlife watching: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of recreation and tourism services. Circalittoral rock is the predominant habitat in the rMCZ Reference Area, and provides a firm substrate for species attachment and habitat for crabs and lobsters (Fletcher and others, 2011). The high biodiversity of the area will support mobile fish species which will support foraging birds and marine mammals. The baseline quantity and quality of the ecosystem service provided is	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. An improvement in the condition of site features and any associated increase in abundance and diversity of species that are visible to wildlife watchers may improve the quality of wildlife watching at the site and therefore the value of the ecosystem service. The designation may lead to an increase in wildlife watching visits to the site, which may benefit the local economy. This increase	Anticipated direction of change: ⇧ Confidence: Low

Table 4b. Recreation	**rMCZ Reference Area 18 St Catherine's Point West**	
assumed to be commensurate with that provided by the features of the site when not in reference condition. The rMCZ Reference Area is a popular area for wildlife watching, particularly bird and marine mammal watching. It has not been possible to estimate the value derived from wildlife watching in the rMCZ Reference Area.	may represent an overall increase in UK wildlife watching visits and/or a redistribution of location preferences. Designating the rMCZ Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities.	
Other recreation: The rMCZ Reference Area is a destination for recreational sailing. Boats taking part in regattas and the Round the Island Race frequently traverse the site. It has not been possible to estimate the value derived from tourism in the rMCZ Reference Area.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Designating the rMCZ Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: Confidence: Low

Table 4c. Research and education	**rMCZ Reference Area 18 St Catherine's Point West**	
Baseline	**Beneficial impact**	
Research: Fletcher and others (2011) identify that the features to be protected by the recommended Marine Conservation Zone (rMCZ) Reference Area can contribute to the delivery of research services. The rMCZ Reference Area overlaps with a Special Area of Conservation, and a number of research activities have been undertaken relating to this larger site. It has not been possible to estimate the value derived from research activities associated with the rMCZ Reference Area.	The rMCZ Reference Area will provide an opportunity to demonstrate the state of designated marine features in the absence of many anthropogenic pressures (Natural England and JNCC, 2010). It will provide a control area against which the impacts of pressures caused by human activities can be compared as part of long-term monitoring and assessment. Other research benefits are unknown.	Anticipated direction of change:  Confidence: High
Education: Fletcher and others (2011) identify that the features to be protected by the rMCZ Reference Area can contribute to the delivery of education services.	MCZ Reference Area designation may provide an opportunity to expand the focus of education events into the marine environment.	Anticipated direction of change: 

Table 4c. Research and education	**rMCZ Reference Area 18 St Catherine's Point West**	
No known education activity takes place in the site.	Designation may aid additional local (to the rMCZ Reference Area) provision of education (e.g. events and interpretation boards), from which visitors would derive benefit. Non-visitors may benefit if the rMCZ Reference Area contributes to wider provision of education (e.g. television programmes, articles in magazines and newspapers, and educational resources developed for use in schools).	Confidence: Low

Table 4d. Regulating services	**rMCZ Reference Area 18 St Catherine's Point West**	
Baseline	**Beneficial impact**	
Regulation of pollution: N/A ***Environmental resilience:*** N/A ***Natural hazard protection:*** As the site is offshore, its features do not contribute to the delivery of this service.	If the conservation objectives of the features are achieved, the features will be recovered to reference condition. Recovery of the broad-scale habitats and closure to fishing could increase the site's benthic biodiversity and biomass, improving the regulating capacity of its habitats. Designating the recommended Marine Conservation Zone (rMCZ) Reference Area will protect its features and the ecosystem services that they provide against the risk of future degradation from pressures caused by human activities (as, if necessary, mitigation would be introduced, with the associated costs and benefits).	Anticipated direction of change: ⇧ Confidence: Low

Table 4e. Non-use and option values	**rMCZ Reference Area 18 St Catherine's Point West**
Baseline	**Beneficial impact**

Table 4e. Non-use and option values	**rMCZ Reference Area 18 St Catherine's Point West**	
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) Reference Area and the ecosystem services provided, even if they do not currently benefit from them. It has not been possible to estimate the value derived from non-use and option values associated with the rMCZ Reference Area.	The rMCZ Reference Area will benefit the proportion of the UK population that values conservation of its 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 Reference Area will recover and protect both the features in reference condition and the option to benefit from the services in the future, from past degradation and the risk of future degradation.	Anticipated direction of change: ⇧ Confidence: Moderate

References

Balanced Seas Final Recommendations Report, 2011. Final Recommendation Submission to Natural England and JNCC.

Balanced Seas Essex Sites Meeting Report, July 2011

Balanced Seas Isle of Wight Sites Meeting Report, February, 2011

Balanced Seas Kingmere Site Meeting Report, July, 2011

Balanced Seas North Kent Sites meeting report, July 2011

Balanced Seas Regional Stakeholder Group Meeting, July 2011

Balanced Seas Solent/IOW/Hants Sites Meeting Report, July, 2011

Balanced Seas East Sussex Sites Meeting Report, July 2011

Balanced Seas Offshore Task Group meeting report, March 2011

Balanced Seas South Kent Sites meeting report, July 2011

DHB. 2010. *Dover Harbour Board: Our Plan for the Next Generation – Ferry Terminal 2*. URL: www.doverport.co.uk [Accessed 10th December 2011].

Direction des Pêches Maritimes et de l' Aquaculture . 2011. *dpma-11-0339-mcz-zonesbritanniques:* URL: password protected.

Dodridge, R. 2010. Letter from Robin Dodridge, Director of Corporate Operations, Dover Harbour Board. 21 September 2010.

Drew Associates, Ltd, 2003. Research into the Economic Contribution of Sea Angling. Study commissioned by Defra, 2003

English Heritage. 2012. Balanced Seas Marine Conservation Zones Impact Assessment Exercise for Archaeology and Heritage: Baselines for each proposed Marine Conservation Zone and Marine Conservation Zone Reference Area, Comments provided by C.Pater, 1 February 2012

FisherMap Data. 2010. *Balanced Seas Reference Area Impact Assessment: Data collection by Balanced Seas laison officers.*

Fletcher, S., Saunders, J., Herbert, R., Roberts, C. & Dawson, K. 2012.*Description of the ecosystem services provided by broad-scale habitats and features ofconservation importance that are likely to be protected by Marine Protected Areas in the Marine Conservation Zone Project area*. Natural England Commissioned Reports, Number 088.

Folkestone Seafront, 2012. Folkestone Seafront: A New Approach. URL: www.folkestoneseafront.com [Accessed 15 March 2012]

Harwich Haven Authority (HHA). 2011. *Maintenance Dredging Protocol Baseline Document: Stour and Orwell Estuaries, Harwich/Felixstowe Harbour and Deep Water Channel - Version 1.0.*

Haven Gateway. 2010. *Driving the Haven Gateway Forward: The economic impact of the ports and logistics sector*. URL: http://ebookbrowse.com/gdoc.php?id=109564048&url=fb7b9a30c664b5851fb0ebd24c68c0d2 [Accessed 9 July 2012]

Kent & Essex IFCA 2011. *Kent and Essex Inshore Fisheries & Conservation Authority: Byelaw summary.* URL: www.kentandessex-ifca.gov.uk/ [accessed 30 October 2011].

Kent County Council. 2010. *Local Transport Plan for Kent 2011-2016.* URL: https://shareweb.kent.gov.uk/Documents/roads-and-transport/road-policies/local-transport-plan-3/final-ltp3.pdf [Accessed 15 April 2012].

Medway Ports, 2012. Medway Ports Marine Overview. URL: http://www.medwayports.com/marine/index.htm [Accessed 19 May 2012]

MCZ Fisheries Model. 2011. Value of landings and the distribution of fishing effort in the Balanced Seas Region *As described in Annex H7*

Newhaven Port. 2012. *Newhaven Port Masterplan*. URL: www.newhavenportauthority.co.uk/documents/PMP_Final_Jan2012_Part1.pdf [Accessed 12 March 2012]

PLA. 2011. *Port of London Authority* URL: www.pla.co.uk [Accessed December 2011].

PLA. 2010. *Annual Report and Accounts 2010.* URL: www.pla.co.uk [Accessed March 2012].

Port of Felixstowe. 2011. *Port Development*. URL: http://www.portoffelixstowe.co.uk/publications/journal/frmfuturedevelopment.aspx [Accessed 19 December 2011].

Ports & Harbours UK. 2012. *Ports and Harbours UK.* URL: http://ports.org.uk/allareas.asp [Accessed 21 March 2012].

PWC Code of Conduct, 2012. *Personal Watercraft Partnership: PWC Code of Conduct.* URL: http://www.pwpulse.co.uk/PWP%20PWC%20code%20of%20conduct.pdf [Accessed 21 June 2012].

Ranger, S., Lowe, R., Sanghera, A. and Solandt, J.L. (2011). *An Assessment of non-use value and other benefits of rMCZs in England. 'Your Seas your Voice' Balanced Seas Region*, May 2009 – October 2011. Marine Conservation Society, 2011

RYA BS IA 1st Tranche Feedback, January, 2012

RYA BS IA 2nd Tranche Feedback, February, 2012

RYA BS IA 3rd Tranche Feedback, March, 2012

Seeley, B., Lear, D., Higgs, S., Neilly, M., Bilewitch, J., Evans, J., Wilkes, P. & Adams, L. 2010. *Accessing and Developing the Required Biophysical Dataset and Data Layers for Marine Protected Areas Network Planning and Wider Marine Spatial Planning Purposes: Mapping of Species with Limited Mobility (Benthic Species).* Task 2B. London: Defra.SOEC, 2011. Solent Ocean Energy Centre: tidal stream energy off Fort Victoria. Information for the Balanced Seas Marine Conservation Zone Project.

Stour and Orwell Estuaries Management Strategy, 2010. Compiled by the Suffolk Estuaries Officer, Suffolk Coast and Heaths AONB Unit in Conjunction with the Stour and Orwell Estuaries Management Group.

Unpublished report, March 2011. 3 pages.

The Crown Estate, 2011. Studland Bay Seagrass Project – Visitor Mooring Viability Appraisal, Marina Projects, April 2011

The SIFCA and the Seagrass Working Group (SWG). 2012. The SIFCA Seagrass Working Group, January 2012

TWL Logistics LTD. 2012. URL: http://www.twlogistics.co.uk/port-of-mistley-logistics.html [Accessed 10 July 2012]

Williams, T. Isle of Wight Angling Intensity Report, 2010

Williams, T. Isle of Wight Angling Boat Survey, 2011

Williams, T. Isle of Wight Shore Angling Intensity Report, 2010

World Nuclear Association. 2012. *Nuclear Power in the United Kingdom.* URL: http://www.world-nuclear.org/info/inf84.html [Accessed 18 June 2012]