

Annex F2 Regional summary (Finding Sanctuary)

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1 Introduction

F2.1 This annex provides a summary of the baseline situation for the environment and human activities in the Finding Sanctuary Project Area, in the absence of Marine Conservation Zones (MCZs), over the Impact Assessment's (IA's) 20-year period of analysis. It also provides a summary of the impacts resulting from the designation of recommended Marine Conservation Zones (rMCZs) in the region. Less detail is included in the summaries for sectors for which only a national-level assessment was carried out,¹ and for sectors which are not expected to be impacted by rMCZs in the Finding Sanctuary regional MCZ project area (south-west). In addition, the impacts on a selection of sub-regional groups of rMCZs are discussed separately in Annex J.

2 Environment

2.1 Regional baseline summary

F2.2 The south-west marine area is exposed to the prevailing westerly winds and waves and subject to some of the strongest tidal currents in the world, particularly along the Bristol Channel. There is a greater variety of fish species found in the South-West than elsewhere in the UK and the region also has some important sea bird and seal habitats. Widespread physical pressures are felt on the marine environment as a result of high levels of fishing and other sectors, such as shipping, telecoms, leisure and recreation and defence, creating more localised pressures.

F2.3 Offshore water depths are generally between 50 metres and 200 metres, extending to over 1,000 metres in the far west past the continental shelf break. The coastline is predominantly rocky but with some areas of intertidal sediment occurring, mainly in bays, inlets and around the coasts of the Bristol Channel. The main offshore habitats are largely sand and gravel with rocky outcrops (UKMMAS, 2010).

F2.4 Sea level is rising as a result of climate change, increasing the risk of coastal erosion and flooding. This is a particular concern for the soft sediment coasts, especially around the Bristol Channel where high tides and storm surges increase the risk of flooding (UKMMAS, 2010).

F2.5 There are big seasonal variations in sea surface temperature, ranging from 8 °C in winter to 18 °C in summer. Some areas become stratified in summer and the strong tides generate tidal fronts, which influence water circulation. Sea temperature is rising as a result of climate change and this has contributed to significant changes in the balance of warm-water and cold-water species in intertidal rocky habitats, although part of the change is due to shellfish harvesting (UKMMAS, 2010).

F2.6 It is thought that mobile fishing gears may be causing damage to sea bed sediment habitats (although there is low confidence in this assessment) and this may have led to the decline or disappearance of large, slow growing and/or fragile invertebrates from areas. Assessed commercial fish stocks in the South-West are either not at full reproductive capacity or are not being harvested sustainably. There have been improvements in some aspects of the demersal fish

¹ National-level assessments have been carried out where it has not been possible to establish impacts by rMCZ or by region. This does not mean that impacts will not occur as a result of rMCZs in the Finding Sanctuary Project Area.

community but there is evidence, including a shift towards smaller fish, which indicates continuing pressure (UKMMAS, 2010).

F2.7 A total of 23 different broad-scale habitats, 29 different species of conservation importance and 22 different habitats of conservation importance are found in the south-west marine area (see Annex B for a summary of the broad scale and Features of Conservation Importance (FOCI) to be protected by rMCZs and the area covered and/or number of occurrences). The ecological condition of habitats and features varies from rMCZ to rMCZ, depending on the localised conditions and the habitats and features exposure to different types of human and environmental pressures (UKMMAS, 2010).

F2.8 Between 2005 and 2010 there was a deterioration in three (intertidal rock, intertidal sediment and deep-sea habitats) out of six habitat types found in the region. The conditions of intertidal rock and sediment habitats are thought to be deteriorating in the South-West as a result of increasing pressures from coastal developments, rising sea levels and temperatures and non-native species. Deep-sea mud habitats are also thought to be deteriorating, primarily as a result of increased pressure from benthic fishing gears, although they are still considered to have relatively few problems. Shallow and shelf subtidal sediments are subject to pressures from human activities and large areas have been affected by mobile bottom gear such as trawlers and dredgers. Areas of subtidal rock are thought to have been less impacted by human activities and have few/no problems, although in some areas habitat has been permanently damaged or removed by mobile fishing gears (UKMMAS, 2010).

F2.9 Indicator species in the South-West show a generally stable pattern with the condition of five out of nine showing no discernible trend while the condition of one, water birds, has been improving. However, overall, the condition of species is thought to be considerably worse than it has been historically. Cleanliness and safety indicators generally show, where evidence is available, relatively few problems and the situation has improved for two indicators, radioactivity and eutrophication (UKMMAS, 2010).

F2.10 Most sectors of human activity have been identified as having, or carrying a risk of causing, detrimental effects on certain habitats and features in certain places (ABPMer, 2010). Mobile bottom fishing gears, including trawling and dredging, have been identified as the principal cause of the unfavourable condition of the broad-scale habitats and FOCI in a number of rMCZs (Finding Sanctuary vulnerability assessments). Other impacting activities identified include other forms of commercial fishing gear, aquaculture and anchoring.

F2.11 While assessments have been made to identify the likely ecological conditions of the broad-scale habitats and FOCI (through the Finding Sanctuary vulnerability assessments), it is harder to identify the likely trends under baseline conditions, even if assuming that the status quo is maintained in terms of human activities and prevailing environmental and climatic conditions. If the intensity and spatial footprint of marine activities increases, then the associated increase in pressures may cause new or further deterioration in the condition of habitats and FOCI. However, it should be noted that the environmental regulation of human activities is improving and this may

go some way to offsetting any potential increase in pressures that a higher intensity of human activities may create.

F2.12 There is a total of 58 rMCZs in the Finding Sanctuary Project Area, 13 of which are rMCZ Reference Areas. (Summary statistics on the coverage of habitats and species can be found in Annex B.) Many of the individual sites contain features which are either unique or rarely represented anywhere else in England or the UK.

F2.13 The Canyons rMCZ, located on the continental shelf break, is unique within the context of England's shelf seas. The area contains a small patch of live deep-water coral *Lophelia pertusa* reef, which is the only living deep-water coral reef recorded within England's seas. Other key habitats in the region include shallow-water kelp forests in Broad Bench to Kimmeridge Bay rMCZ, which harbour a number of rare seaweeds including the red seaweed *Gracilaria bursa-pastoris* and the brown seaweeds *Zanardinia prototypus* and *Padina pavonica*. Several unusual fish are found at Kimmeridge such as Montagu's blenny *Coryphoblennius galerita*, the Connemara clingfish *Lepadogaster candollei*, the Cornish sucker *Lepadogaster lepadogaster* and the rarely recorded black-faced blenny (*Tripterygion delaisi*) occurring on rocky ledges.

F2.14 The mix of biotopes represented in the sea bed at Morte Platform rMCZ is rarely represented anywhere else in the UK. A range of features is present, including Ross worm *Sabellaria spinulosa* reefs, sub-littoral biogenic reef, polychaete-rich communities and tide-swept channels. Greater Haig Fras rMCZ is the only substantial area of rocky reef in the Celtic Sea beyond the coastal margin. It supports a variety of fauna, ranging from jewel anemones and Devonshire cup coral near the peak of the outcrop to encrusting sponges, crinoids and ross coral towards the base of the rock. The high-quality reefs at the Manacles rMCZ support a number of associated FOI species, including one of the best examples of pink sea fan communities and the pink sea fan anemone in the region. The eastern boundary of rMCZ Reference Area The Fal is located just north of St Mawes. The St Mawes bank has the most extensive bed of the unattached calcified seaweed (maerl) in England and Wales.

F2.15 Studland Bay contains dense *Zostera marina* seagrass beds which are an important habitat for two species of seahorse, *Hippocampus hippocampus* and *Hippocampus guttulatus*. It is the only known breeding location for both indigenous seahorse species in the UK. The site is considered to be of international importance for the long-snouted or spiny seahorse *H. guttulatus* with the largest known breeding population of the species in the UK.

F2.16 Several sites are renowned for being good breeding grounds, including Lundy Reference Area rMCZ where a breeding colony of grey seals *Halichoerus grypus* is present on the island. The Torbay area is important for bird breeding colonies and for guillemot feeding areas, and includes an important nursery for commercial fish species. Whitsand and Looe Bay also intersects with a good nursery area for commercial fish species, as well as an important site for sea birds. Many of the sites have ecological importance as nursery areas: for example, Studland Bay rMCZ is a nursery area for undulate ray *Raja undulata*, Taw Torridge Estuary rMCZ is a nursery area for

sea bass and Skerries Bank and Surrounds rMCZ is an important breeding area for flat fish, and a breeding ground for mobile species.

2.2 Regional summary of impacts

F2.17 The final recommended configuration of rMCZs in the Finding Sanctuary regional MCZ project area covers a combined total area of 17,065km², equivalent to approximately 18% of the total regional area. When combined with other types of Marine Protected Areas (MPAs), the coverage increases to 19% of the project area. The range of estuarine, coastal, inshore and offshore rMCZs capture the full range of benthic habitats in the project area.

F2.18 Across the rMCZs, 425 draft conservation objectives are proposed and there are a further 11 instances where draft conservation objectives are yet to be determined. The total figure rises to over 500 if the Isles of Scilly Sites rMCZs is broken down into its individual sites. The draft conservation objectives are as follows:

- 70 'recover to reference condition' conservation objectives;
- 70 'recover to favourable condition' conservation objectives;
- 285 'maintain at favourable condition' conservation objectives.

F2.19 Designation of the rMCZs will promote an ecologically coherent network of sites contributing to the conservation of marine biodiversity in the Finding Sanctuary Project Area and in the wider UK marine area. This will contribute to the protection of living, non-living, cultural and/or historic marine resources. It will provide protection for threatened and declining species and habitats as identified by the Oslo and Paris (OSPAR) Convention). Together, all the features captured within the rMCZs play an important role in ecosystem functioning. Each distinct habitat is replicated in other protected areas. Such replication enables adjacent populations to interact and be mutually sustaining. The size of the MCZs promotes the longevity of species, habitats and ecological processes and services.

3 Human activities

3.1 Aggregate extraction

Regional baseline summary

F2.20 No marine aggregate extraction currently takes place in or within 1km of any of the rMCZs in the Finding Sanctuary Project Area. A number of strategic resource areas have been identified in the project area and it is assumed that one licence application will come forward in relation to one of these areas over the IA 20-year timeframe. It is anticipated that this may be in the North Devon area.

Regional summary of impacts

Source of costs

F2.21 Two management scenarios have been employed for the marine aggregates sector:

- Low cost scenario: An increase in the costs of assessing environmental impacts for future licence applications within 1km of an rMCZ (it is not anticipated that any additional mitigation of impacts on features protected by rMCZs will be needed relative to the mitigation provided in the baseline).
- High cost scenario: An increase in the costs of assessing environmental impacts for future licence applications (distance not specified) (it is not anticipated that any additional mitigation of impacts on features protected by rMCZs will be needed relative to the mitigation provided in the baseline).

Low cost management scenario impacts

F2.22 No current or future activities are anticipated within 1km of an rMCZ, and therefore no costs are anticipated under this scenario.

High cost management scenario impacts

F2.23 Impacts of rMCZs on future licence applications for aggregate extraction are assessed at the national scale only under this scenario and a summary is provided in the Evidence Base. The impact is anticipated to be an additional cost in the licence application only.

3.2 Aquaculture

Regional baseline summary

F2.24 There are eight aquaculture businesses within or in close proximity to rMCZs (The Dart, Devon Avon and The Camel Estuary rMCZs) that produce Pacific oysters *Crassostrea gigas*. Between them, these eight businesses produced over 120 tonnes of Pacific oysters in 2010 (shellfish cultivators and Devon and Severn Inshore Fisheries and Conservation Authority (IFCA), pers. comm., 2011), worth an estimated £0.506m² and generating an estimated £0.279m of gross value added (GVA).³ At least two of the businesses are solely reliant on the cultivation of Pacific oysters (shellfish cultivators, pers. comm., 2011).

F2.25 These businesses primarily use diploid stock for Pacific oyster cultivation. Some of the businesses have tried using triploid stock or use triploid stock as a small proportion of their total Pacific oyster stock. The businesses generally prefer diploid to triploid stock because of lower mortality rates and lower labour requirements as well as difficulty in sourcing an adequate supply of triploid stock (shellfish cultivators, pers. comm., 2011). There was no indication from operators that they are likely to change their current stock type preferences (shellfish cultivators, pers. comm., 2011).

Regional summary of impacts

Source of costs

² The value estimate is based on actual revenues where provided by operators (pers. comm., 2011), or on an assumption of £4,300/tonne where revenue data are not provided.

³ GVA has been calculated by applying a GVA conversion factor of 0.55 (GVA as a % of output at 55%) (UKMMAS, 2010) to value of output.

F2.26 Two management scenarios have been considered which reflect the uncertainty on the need for Pacific oyster cultivators to use triploid rather than diploid stock:^{4,5}

- Lowest cost management scenario: No additional management.
- Highest cost management scenario: Compulsory use of triploid stock.

Lowest cost management scenario impacts

F2.27 No costs are anticipated as a result of this scenario.

Highest cost management scenario impacts

F2.28 Eight businesses that cultivate oysters within or in close proximity to rMCZs (The Dart, Devon Avon and The Camel Estuary rMCZs) would need to use triploid stock to reduce the risk of wild settlement of Pacific oysters in the MCZs. Given the current shortage of supply of triploid stock, it is unlikely that sufficient volumes of triploid seed stock could be sourced to enable the affected producers to continue cultivating Pacific oysters at their current levels (shellfish cultivators, pers. comm., 2011).⁶ If the affected businesses could not source increased volumes of triploid stock, under this management scenario Pacific oyster output by the individual businesses would decline by between 90% and 100%. Ultimately, this may result in the total cessation of Pacific oyster cultivation by the affected businesses, resulting in a decline in UK Pacific oyster output of over 120 tonnes/yr. The lost output is worth an estimated £0.506m, and will result in a reduction in GVA of approximately £0.279/yr (based on 2010 data) compared with the baseline situation. This is equivalent to approximately 9% of UK Pacific oyster cultivation GVA and 2% of UK shellfish cultivation GVA.⁷ Over the IA's 20-year timeframe, the costs are estimated to have a present value of £3.959m.

F2.29 The loss of revenue from Pacific oyster cultivation may impact on the broader viability of the affected businesses, thereby potentially resulting in a loss of output of other aquaculture species produced by these businesses. While businesses may be able to adapt to farm other species instead, such as mussels, clams and cockles, it is unclear whether operators would chose to do this.

F2.30 It should be noted that if the supply of triploid seed stock could be adequately increased then this may mitigate the impact on the businesses, although this is unlikely in the short term. However, businesses in the Dart Estuary, and to a lesser extent the Camel Estuary, are

⁴ Use of triploid seed stock rather than diploid seed stock may reduce the risk of wild settlement of Pacific oysters, which are considered to be an invasive non-native species in south-west England. See Annex H for further information.

⁵ Pressures caused by aquaculture were considered in the regional MCZ project vulnerability assessments. With the exception of Pacific oyster cultivation, no other aspects of aquaculture operations were identified as causing significant pressures on MCZ feature condition and therefore no management of these activities is expected.

⁶ Discussions with UK seed stock producers corroborate that there is a shortage of supply with no immediate opportunity to increase it (Seasalter (Walney) Limited, pers. comm., 2011 and Seasalter Shellfish (Whitstable) Limited, pers. comm., 2011).

⁷ UK GVA data are provided in Annex D.

concerned that triploid stock may not grow as successfully as diploid stock (see site-specific impacts in Annex I for more details).

F2.31 The probability of either management scenario occurring is unknown. Therefore, the best estimate of the cost is arbitrarily assumed to be the mid-point between the lowest and highest cost scenarios, which results in a present value of costs over 20 years of £1.979m.

3.3 Archaeological heritage

Regional baseline summary

F2.32 There is currently evidence of archaeological features in 31 rMCZs in the Finding Sanctuary Project Area, eight of which are rMCZ Reference Areas. Archaeological features include protected wrecks, other wrecks, industrial structures and peat beds. A number of rMCZs cover areas which English Heritage has indicated are likely to be of interest for archaeological excavation in the future as they are relevant to its National Heritage Protection Plan (theme 3A1.2) (English Heritage, pers. comm., 2012).

Regional summary of impacts

Source of costs

F2.33 Two management regimes are considered, one for regular rMCZs and the other for rMCZ Reference Areas:

- rMCZs: An 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.
- rMCZ Reference Areas: An 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.

Management scenario impacts

F2.34 It is expected that an extra cost will be incurred in the assessment of environmental impacts made in support of any future licence applications for archaeological activities. The likelihood of a future licence application being submitted in any given rMCZ is not known, so no overall cost to the sector has been estimated. Where an individual licence application does come forward, the additional cost of assessment is likely to be in the region of £500 to £10,000 (English Heritage, pers. comm., 2011).

F2.35 In addition, for rMCZ Reference Areas, if archaeologists respond to the prohibition of excavation by undertaking an alternative archaeological excavation in another locality (outside an rMCZ Reference Area), this could result in additional costs to the archaeologists. It is not possible to predict at which rMCZs, when or how often this could occur, and so no costs are provided in the

IA. The prohibition of potential excavation and therefore interpretation of archaeological evidence from the rMCZ Reference Areas will decrease acquisition of historical knowledge of past human communities from the site, resulting in a cost to society.

3.4 Cables (*interconnectors and telecom cables*)

Regional baseline summary

F2.36 South-west England hosts a number of the most heavily used telecommunications cable landing sites in the UK, and is the main European landing point of transatlantic, African and Asian submarine telecommunications cables. There are a number of rMCZs located very close to these landing sites, resulting in multiple cables running through the rMCZs. The rMCZs are: Bideford to Foreland Point rMCZ, Hartland Point to Tintagel rMCZ, Cape Bank rMCZ and Land's End rMCZ. At least 28 active submarine telecommunications cables pass through the south-west marine area, typically overlapping with multiple rMCZs. No cables overlap with rMCZ Reference Areas. One new telecommunications cable is currently expected in the project area, and is likely to overlap with one rMCZ (The Crown Estate, pers. comm., 2012). There are no interconnector power cables in the South-West.

Regional summary of impacts

Source of costs

F2.37 There will be an 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 rMCZs will be needed relative to the mitigation provided in the baseline).

Management scenario impacts

F2.38 It is not anticipated that any additional mitigation measures (above those in the baseline) will be imposed on any existing or future cables as a result of rMCZs in the Finding Sanctuary Project Area. The IA assumes that only future licence applications for cables could incur an additional cost due to rMCZs. It is not yet known where future cables will be proposed but it is assumed that one cable will be proposed in the Finding Sanctuary Project Area once every five years over the IA 20-year period. It is assumed that none of these cables will overlap with rMCZ Reference Areas. It is assumed that each proposal will be required to consider its impact on MCZ features and their conservation objectives. The additional cost per licence application to do this is estimated to be £10,000. The best estimate of the present value of the cost to the sector of the regional suite of rMCZs is therefore estimated to be £0.027m for the 20-year period of the IA. The low and high cost estimates (based on lower and higher estimates of the number of cables affected) of the present value of the cost to the sector are £0.013m and £0.040m respectively, over the 20-year period of the IA.

3.5 Coastal development

F2.39 As no impacts are anticipated on coastal developments in the South-West, no further discussion is provided here. (Impacts to port and harbour developments are included in the 'Ports, harbours, shipping and disposal sites' section.)

3.6 Commercial fisheries

F2.40 This section summarises the baseline and impacts of the regional suite of rMCZs on UK and non-UK fishing activity. The section explains the management scenarios, followed by discussion for UK vessels (by gear type) and non-UK vessels.

F2.41 Management scenarios for individual rMCZs vary depending on the nature of the features being protected and their exposure to commercial fishing activity. Uncertainty about whether additional management of fisheries will be needed means that multiple management scenarios have been identified for individual gear types and rMCZs, with some rMCZs having up to five different management scenarios for an individual gear type.

F2.42 The summary of impacts of the regional suite of rMCZs provided here focuses on the following in order to present the range of potential costs to the sector:

- **Lowest cost management scenario:** This is the management scenario for each gear type in each rMCZ that results in the lowest cost to the commercial fishing sector (it includes scenarios that suggest no additional management).
- **Highest cost management scenario:** This is the management scenario for each gear type in each rMCZ that results in the highest cost to the commercial fishing sector.
- **Best estimate:** This is calculated using assumptions on the probability of the low cost and high cost scenarios occurring, which in turn are dependent on assessments of draft conservation objectives and current fishing pressures.⁸

F2.43 Commercial fishing takes place to varying degrees in nearly all of the rMCZs in the South-West. As such, a wide range of fisheries and fishing conditions are covered across the regional suite of rMCZs.

F2.44 Under the lowest cost management scenario, the value of landings affected is relatively low, although some significant impacts are anticipated for individual rMCZs. It is estimated that rMCZs will affect 0.02% of total UK vessel GVA/yr.⁹ Over the 20-year timeframe of the IA, the estimated value of UK vessel landings and GVA affected have present values of £2.133m and £1.048m respectively. Under the highest cost management scenario, rMCZs in the South-West will affect approximately 0.3% of total UK vessel GVA/yr.¹⁰ Over the 20-year timeframe of the IA, the estimated value of UK vessel landings and GVA affected have present values of £28.320m and £12.893m respectively.

⁸ An explanation of the assumptions used to identify the best estimate for each gear type in each rMCZ is set out in Annex H.

⁹ UK GVA data are provided in Annex D.

¹⁰ UK GVA data are provided in Annex D.

F2.45 Under the best estimate, rMCZs will affect approximately 0.1% of total UK vessel GVA/yr.¹¹ Over the 20-year timeframe of the IA, the best estimates of the value of UK vessel landings and GVA affected have present values of £11.960m and £5.408m respectively.

F2.46 The extent to which the rMCZs will result in the displacement of affected fishers from the rMCZs, and the extent to which they will result in a reduction in fishing effort and landings, are generally unclear. In the absence of a better understanding of the effect of rMCZs on fishing decisions, it is assumed that the cost impact to the sector is equivalent to the value of landings attributed to the area of the rMCZs. This is likely to be an overestimate of the true value of landings affected. This is because a proportion of the effort currently expended within rMCZs is likely to be redistributed to areas outside rMCZs as fishers seek to offset the impacts of rMCZ-related fisheries management.

F2.47 Port businesses and associated markets, as well as secondary and ancillary businesses may be affected by any significant decline in landings throughput. The largest costs are likely to be seen at the key landing and home ports of Brixham, Newlyn and Plymouth.

F2.48 Tables 1, 2 and 3 provide the rMCZ baseline and potential impact of rMCZs on UK vessels in terms of the value of landings/yr, GVA/yr and the number of rMCZs in which management may affect fishing. Further details on the rMCZ-specific lowest cost and highest cost management scenarios considered in this annex can be found in the management scenarios tables and maps provided in Annex H7 and the assessment of rMCZ impacts in Annex I.

Table 1: Baseline and affected value of landings for UK vessels

Gear type	Baseline	Impact		
		Low cost scenario	High cost scenario	Best estimate
Dredges	0.168	0.011	0.108	0.058
Bottom trawls	0.852	0.005	0.825	0.414
Mid-water trawls	0.039	0.000	0.000	0.000
Pots and traps	1.806	0.067	0.519	0.180
Nets	0.641	0.038	0.406	0.131
Hooks and lines	0.238	0.029	0.134	0.058
Hand collection	0.000	0.000	0.000	0.000
Total	3.743	0.150	1.993	0.842

Note: these figures have been adjusted to account for overlaps between rMCZs.

Table 2: Baseline and affected GVA for UK vessels (£m/yr)

Gear type	Baseline	Impact		
		Low cost scenario	High cost scenario	Best estimate
Dredges	0.080	0.005	0.051	0.028
Bottom trawls	0.357	0.002	0.346	0.174
Mid-water trawls	0.022	0.000	0.000	0.000
Pots and traps	0.874	0.032	0.251	0.087

¹¹ UK GVA data are provided in Annex D.

Nets	0.284	0.017	0.180	0.058
Hooks and lines	0.140	0.017	0.079	0.034
Hand collection	0.000	0.000	0.000	0.000
Total	1.757	0.074	0.907	0.380

Note: these figures have been adjusted to account for overlaps between rMCZs.

Table 3: Number of rMCZs with >0.001m/yr value of landings

Gear Type	Baseline	Impact		
		Low cost scenario	High cost scenario	Best estimate
Dredges	16	2	12	12
Bottom trawls	38	3	29	28
Mid-water trawls	10	0	0	0
Pots and traps	30	4	13	13
Nets	30	3	17	15
Hooks and lines	22	2	11	7
Hand collection	0	0	0	0
Total	48	9	34	33

Note: these figures have been adjusted to account for overlaps between rMCZs.

UK dredges

F2.49 Baseline: Fishing with dredges inside south-west rMCZs primarily targets scallops, although there is also oyster dredging in two rMCZs off the Dorset coast. The greatest value of landings from dredging activity occurs in the rMCZs along the south coasts of Cornwall and Devon and the Dorset coast. Five of the rMCZs account for over 80% of total estimated dredge landings from south-west rMCZs (MCZ Fisheries Model). Fishing effort by the larger vessel scalloping fleet has been particularly high in the Eastern Channel (outside the south-west marine area) as a result of increased scallop abundance in the area (Defra, 2011). As this abundance subsides, increased effort may be expected in the rMCZs of the South-West that were historically fished by these vessels. The largest south-west fleet operates out of Brixham, with other significant fleets at Newlyn and Plymouth.

F2.50 Impacts: Under the low cost scenario, two rMCZ Reference Areas will affect a combined total of £0.011m/yr of landings, of which £0.010m/yr is as a result of South-East of Portland Bill rMCZ Reference Area. In this rMCZ, the impact falls on a single operator who dredges for mussels in the area. Under the high cost scenario, over £0.100m/yr of landings will be affected, with 11 rMCZs affecting >£0.001m/yr of landings. The most significant impacts are as a result of Chesil Beach and Stennis Ledges rMCZ and Torbay rMCZ, both of which overlap parts of known scallop beds. Displacement of fishing effort may lead to increased pressure on the remaining areas of scallop beds, potentially affecting fishers' catch rates. If fishers respond by fishing alternative grounds further from shore, then risks to the safety of fishers and their vessels may be increased. The best estimate is that £0.058m/yr of UK vessel landings and £0.028m/yr of UK vessel GVA will be affected by the suite of rMCZs, with present values over 20 years of £0.829m and £0.394m respectively.

UK bottom trawls

F2.51 Baseline: Bottom trawl activity is greatest in those rMCZs that are outside of the 6 nautical mile (nm) limit. However, some level of activity occurs in most rMCZs with the exception of rMCZs within estuaries or covering intertidal areas. Five of the rMCZs account for over 60% of the total estimated bottom trawl landings from south-west rMCZs. Bottom trawl vessels active in the rMCZs operate out of many of the ports around the south-west coast as well as ports elsewhere in the UK. The largest active fleets are based at Brixham, Newlyn and Plymouth.

F2.52 Beam trawlers from Brixham and Plymouth, targeting species including sole and cuttlefish, are typically most active in the rMCZs along the south coast. Newlyn beam trawlers targeting megrim and anglerfish are typically most active in rMCZs around the far south-west coast and the far south-west offshore area. Otter trawlers typically target seasonal fisheries with most effort expended within 12nm in the rMCZs off the Devon and Cornwall coasts.

F2.53 Impacts: Under the low cost scenario, two rMCZ Reference Areas will each affect approximately £0.001m/yr of UK vessel landings. Neither is anticipated to have a significant impact on the sector. Under the high cost scenario, 28 rMCZs will each affect >0.001m/yr of UK vessel landings. Inside 12nm, the most significant bottom trawl value of landings affected are anticipated as a result of the North of Lundy rMCZ, which will particularly affect the North Devon otter trawl fleet; also Cape Bank, South of Isles of Scilly and South-East of Falmouth rMCZs, which will affect the otter trawl and beam trawl fleets in the far south-west, in particular vessels from Newlyn and Plymouth. Offshore, the most significant impacts are anticipated as a result of the South-West Deeps (East and West) rMCZs and the Western Channel rMCZ, which will particularly affect the Newlyn offshore beam trawl fleet. Redistribution of displaced fishing effort is likely to occur in response to the highest cost management scenarios. This may result in increased fishing costs, longer fishing trips, increased gear conflict and increased safety risks.

F2.54 The best estimate is that £0.414m/yr of UK vessel landings and £0.174m/yr of UK vessel GVA will be affected by the suite of rMCZs, with present values over 20 years of £5.890m and £2.468m respectively.

UK mid-water trawls

F2.55 Baseline: There is a low level of mid-water trawling in the south-west rMCZs by UK vessels, with the greatest value of landings taken from rMCZs in the far south-west beyond 12nm. Five rMCZs account for nearly 85% of total estimated mid-water trawl landings from south-west rMCZs.

F2.56 Impacts: No rMCZs affect >£0.001m/yr of landings by UK mid-water trawlers under either the low cost or the high cost scenario. As such, no significant impacts are anticipated. The best estimate of the value of landings and GVA affected is £0.000m/yr.

UK pots and traps

F2.57 Baseline: Out of all of the gear categories, pots and traps have the highest value of landings from rMCZs in the South-West. Activity is concentrated in rMCZs within 6nm. There are very low levels of activity in rMCZs outside 12nm. Five of the rMCZs account for approximately

85% of total estimated pot and trap landings from south-west rMCZs. Key species targeted by fishers are brown crab and lobster. Pot and trap vessels active in the South-West are typically less than 15 metres in length and most are under 10 metres (MMO, 2011). As the majority of vessels are small, they have relatively small ranges and generally work defined areas close to their home ports. The location of the rMCZs within 12nm therefore strongly influences the home ports of the vessels that are active within them.

F2.58 Impacts: Under the low cost scenario, four rMCZ Reference Areas will affect >£0.001m/yr of landings. Each rMCZ will affect a different group of local vessels, potentially resulting in a redistribution of displaced effort into remaining fishing grounds. The Fal rMCZ Reference Area may have significant impacts on approximately eight local under 10 metre potters, particularly during winter months when, because of the weather, their activities are largely confined to the estuary.

F2.59 Under the high cost scenario, 13 rMCZs will affect >£0.001m/yr of landings. Of the total £0.519m/yr of landings affected, £0.357m/yr is due to Cape Bank rMCZ. A number of rMCZs may have significant impacts on the affected fishers and the viability of their businesses. Scope for redistributing displaced fishing effort is often constrained by the availability of good fishing grounds, and for a number of coastal rMCZs displacement may increase safety risks as fishers chose to fish further offshore.

F2.60 The best estimate is that £0.180m/yr of UK vessel landings and £0.087m/yr of UK vessel GVA will be affected by the suite of rMCZs, with present values over 20 years of £2.564m and £1.241m respectively.

UK nets

F2.61 Baseline: Netters are active in both inshore and offshore rMCZs. Five of the rMCZs account for nearly 75% of total estimated net landings from south-west rMCZs. The target species vary according to the type of netting and the location of the rMCZ. Netting in south-west rMCZs is predominantly with set gill nets and entangling nets targeting species that include pollack, anglerfish, ling, crawfish and red mullet. Under 15 metre vessels predominantly net in the rMCZs within 12nm and larger vessels of up to 25 metres are active further offshore.

F2.62 Impacts: Under the low cost scenario, four rMCZ Reference Areas will each affect >£0.001m/yr of landings. In particular, The Fleet Reference Area rMCZ will effectively close a licensed eel fishery, affecting 5 vessels, and Haig Fras rMCZ Reference Area will close part of a significant offshore netting ground. Under the high cost scenario, 17 rMCZs will each affect >£0.001m/yr of landings. Inshore rMCZs may have significant impacts on the affected fishers and the viability of their businesses, in particular Cape Bank rMCZ. Scope for redistributing displaced effort is often constrained by the availability of good fishing grounds and for a number of coastal rMCZs may increase safety risks if fishers choose to fish further off shore. Of the offshore rMCZs, Greater Haig Fras rMCZ has the greatest impact, affecting an estimated £0.126m/yr of landings.

F2.63 The best estimate is that £0.131m/yr of UK vessel landings and £0.058m/yr of UK vessel GVA will be affected by the suite of rMCZs, with present values over 20 years of £1.858m and £0.823m respectively.

UK hooks and lines

F2.64 **Baseline:** There is no fishing with hooks and lines in the majority of the rMCZs in the South-West. Five of the rMCZs account for approximately 95% of the total estimated landings from the south-west suite of rMCZs. Most fishing with hooks and lines is in rMCZs within 12nm by small vessels (of less than 15 metres). Hand lining for mackerel and bass is most common within 12nm. There is also a productive pollack fishery in the Cape Bank rMCZ, which extends from inside 6nm to outside 12nm. There is some activity in the far south-west offshore area using set long lines along the continental shelf break.

F2.65 **Impacts:** Under the low cost scenario, two rMCZ Reference Areas, will affect >£0.001m/yr of landings. Of the total £0.029m/yr of landings affected, £0.027m/yr is due to Cape Bank rMCZ Reference Area. Under the high cost scenario, of the £0.132m/yr of landings affected, £0.100m/yr is due to Cape Bank rMCZ. The rMCZ covers the majority of a pollack hand line fishery. The closure of this area may have significant impacts on the (approximately) 12 vessels that regularly fish there.

F2.66 The best estimate is that £0.057m/yr of UK vessel landings and £0.034m/yr of UK vessel GVA will be affected by the suite of rMCZs, with present values over 20 years of £0.814m and £0.478m respectively.

UK collection by hand

F2.67 **Baseline:** There is a very low level of commercial activity in the south-west rMCZs. Occasional scallop diving is known to take place in The Fal rMCZ Reference Area.

F2.68 **Impact:** The Fal rMCZ Reference Area will impact commercial scallop divers under both the low and high cost scenarios. The rMCZ will remove an area historically targeted by two commercial scallop divers, although it is not currently fished. No value of landing estimates are available. No impacts are anticipated as a result of any other rMCZs.

Non-UK fleet

F2.69 **Baseline:** Non-UK vessels, typically of more than 15 metres, are active in the all rMCZs outside 6nm. There is a high level of activity by French, Irish and Belgian trawlers through the suite of rMCZs. Rising fuel costs have resulted in an increase in activity by French bottom trawlers in the wider south-west region (Bass Normandie, pers. comm., 2011). Fishing with static gears (pots and traps, nets, and hooks and lines) is less prevalent, but occurs in a number of the rMCZs outside 6nm. There is significant Spanish long line activity in the far south-west.

F2.70 With the exception of French vessels, non-UK vessel value of landings estimates are not available for south-west rMCZs. The estimated value of landings for French vessels from the

south-west suite of rMCZs is £7.447m/yr. Of this, £6.812m/yr is by mobile benthic gears (dredges and bottom trawls) and £0.634m/yr by static gears (pots and traps, nets, and hooks and lines).

F2.71 Impact: Under the low cost scenario, non-UK vessels, primarily those from Belgium, France, Ireland and Spain, will be affected by a total of five rMCZ Reference Areas. The estimated value of French vessel landings affected is £0.066m/yr, of which £0.058m/yr is by mobile benthic gears. It has not been possible to obtain information on the value of other non-UK vessel landings affected by the rMCZs.

F2.72 Under the high cost scenario, non-UK vessels using static gears, bottom trawls/dredges and mid-water trawls will be affected to varying degrees by rMCZs. A total of 24 rMCZs will affect non-UK vessels under this scenario. In particular, French bottom trawlers (23 rMCZs), Belgian bottom trawlers (10 rMCZs), Irish bottom trawlers (4 rMCZs) and Spanish longliners (4 rMCZs). The estimated value of French vessel landings affected is £7.442m/yr, of which £6.812m/yr is by mobile benthic gears. It has not been possible to obtain information on the value of other non-UK vessel landings affected by the rMCZs. In many instances, the rMCZ, for example South-West Deeps (East), is expected to result in the displacement of particular types of fishing effort which may have unknown knock-on impacts (Asociación Nacional des Armadores de Pesca de Gran Sol (ANASOL), Organización de Productores de Altura de Ondarroa (OPPAO), OPP-7 and Puerto de Caleiro, pers. comm., 2011).

F2.73 The best estimate is that £3.619m/yr of French vessel landings will be affected by the suite of rMCZs, with a present value over 20 years of £51.431m. Best estimate values are not available for other non-UK vessels.

Displacement

F2.74 The extent to which the rMCZs will result in the displacement of affected fishers from the rMCZs, and the extent to which they will result in a reduction in fishing effort and landings, are generally unclear. In most instances, fishers and fisheries' representatives found it difficult to specify how the rMCZ would affect their future fishing decisions. While some examples can be identified for some rMCZs, there is insufficient information to enable any analysis of displacement at the regional level.

F2.75 Redistribution of fishing effort will be most significant in response to the higher cost management scenarios, and could result in a number of impacts which are discussed below. In many instances, redistribution of fishing effort to areas outside rMCZs may result in increased landings from outside rMCZs that compensate to some degree for landings no longer taken from within rMCZs.

F2.76 In some instances, rMCZs are likely to increase the costs of fishing by increasing steaming distances for fishers who respond by fishing other grounds, such as otter trawlers that currently fish at Cape Bank rMCZ. If fishers decide to fish alternative grounds further from shore, then risks to the safety of fishers and their vessels may be increased. This could arise for the otter trawlers and scallop dredgers that fish at Torbay rMCZ and Chesil Beach and Stennis Ledges rMCZ and

for potters who currently fish within Bideford to Foreland Point rMCZ. Increases in fuel consumption as a result of increased steaming will result not only in increased fuel costs but also in increased greenhouse gas emissions by the commercial fishing sector.

F2.77 Redistribution of fishing effort may reduce fishing efficiency if catch rates do not match those attained inside rMCZs. This may increase the number of days spent at sea by fishers, causing them to be away from their families for longer periods. Less efficient fishing may also increase time spent fishing and increase the use of fishing gear, for example, through an increased number of tows by trawlers. These may have negative environmental impacts, including greater pressures on benthic habitats from fishing gears, and greater greenhouse gas emissions from increased fuel consumption.

F2.78 Gear conflict between mobile and static fishing gears may increase as a result of the displacement of bottom trawl fishing effort from rMCZs, such as around South-East of Falmouth rMCZ. This could result in social tensions within local fishing communities as well as increased fishing costs as a result of lost or damaged fishing gear.

3.7 Flood and coastal erosion risk management (coastal defence)

Regional baseline summary

F2.79 Flood and coastal erosion risk management (FCERM) takes place in and adjacent to coastal and estuarine rMCZs only. Existing FCERM infrastructure is present in or adjacent to at least 24 south-west rMCZs. For two thirds of these rMCZs there is a mix of Shoreline Management Plans (SMPs), including 'hold the line', 'managed realignment', and 'no active intervention'. Future FCERM policies may come forward in relation to 'hold the line' SMP policies over the period to 2032. At least ten schemes planned to be implemented in the next five years are within or adjacent to rMCZs. It has not been possible to estimate the total number of schemes that may come forward over the IA timeframe, or the number of associated licence applications (Environment Agency, pers. comm., 2012).

Regional summary of impacts

Source of costs

F2.80 There will be an 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).

Management scenario impacts

F2.81 As a result of rMCZs, it is anticipated that additional costs will be incurred in assessing environmental impacts in support of future licence applications for Flood and Coastal Erosion Risk Management (FCERM) schemes in and adjacent to rMCZs. For each licence application these costs are expected to arise as a result of approximately 0.5 to 1 day of additional work, although there may be cases where further additional consultant time is needed (Environment Agency, pers. comm., 2012). As it was not possible to obtain information on the likely number of licence applications that will be made over the 20 year period of the IA or estimates of the potential

increase in costs, it was not possible to estimate a total cost for the sector. It is anticipated that no additional mitigation of impacts will be required (Environment Agency, pers. comm., 2012)

3.8 National defence

Regional baseline summary

F2.82 National defence activities are known to take place within the majority of the rMCZs in the Finding Sanctuary Project Area, including rMCZ Reference Areas. The types of activity are numerous and include live firing and submarine exercises. A brief summary of the activities that take place in each rMCZ is provided in Annex I. Detailed information is not available.

Regional summary of impacts

Source of costs

F2.83 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.

Management scenario impact

F2.84 The MOD (pers. comm., 2011) has stated that designation of rMCZs is unlikely to have any direct impact on the current level and type of MOD activity in the Finding Sanctuary Project Area. However, should the future level of MOD activity increase, there is a possibility that some MCZs could impact on future military activity. It is assumed that the MOD will mitigate the impact of military activity on MCZ features through additional planning consideration during operations and training (MOD, pers. comm., 2011). The cost to the MOD to do this is assessed at the national level only (see the Evidence Base) and cannot be broken down for the region.

3.9 Oil and gas related activities

Regional baseline summary

F2.85 The baseline describes only those aspects of oil and gas exploration and production, gas interconnectors and gas storage activities (hereafter referred to as oil and gas activity) and carbon capture and storage (CCS) that could be impacted upon by MCZs. The IA assumes that only the costs of future oil and gas and CCS licence applications may be impacted by MCZ designation. Therefore, currently consented developments are not described in the baseline.

F2.86 In the 26th Seaward Licensing Round, licensed blocks were offered to operators to extract oil and gas from the UK continental shelf in October 2010 and December 2011. Within the Finding Sanctuary Project Area, four of the six blocks that were offered in the 26th Round were later awarded to operators for commercial extraction (in October 2010 and December 2011). In the absence of more detailed information about future oil and gas licence applications, the IA assumes that during the 20-year period of analysis, one licence application is submitted for each of the six blocks offered in the 26th Round.

F2.87 There are currently no existing or planned oil and gas or CCS developments within any of the potential rMCZ Reference Areas. Nor do any of the potential rMCZ Reference Areas overlap with blocks in the 26th Round with 'significant discoveries' or 'fallow blocks with discoveries' (see Annex H). However, seven rMCZ Reference Areas overlap with blocks on offer in the 27th Round. None of these blocks yet has discoveries and it is not known if any of these blocks will be of commercial interest. The Department of Energy and Climate Change (DECC) has stated that it is unlikely that any rMCZ Reference Areas will overlap with future oil and gas (or CCS) infrastructure (DECC, pers. comm., 2012). No future licence applications for CCS within rMCZs are anticipated during the 20-year period of the IA (Carbon Capture and Storage Association (CCSA), pers. comm., 2011).

F2.88 There is the potential for activities in other aspects of the sector in the South-West, including gas storage near Portland Bill; however, no impacts are anticipated as a result of rMCZs and so no further discussion is provided.

Regional summary of impacts

Source of costs

F2.89 There will be an 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).

Management scenario impacts

F2.90 The estimated cost of MCZs to oil and gas and CCS operators is comprised solely of the additional costs anticipated in the assessment of the environmental impact, which is completed in support of a future licence application. In rMCZs that are not rMCZ Reference Areas, based on the advice of DECC, the Joint Nature Conservation Committee (JNCC) and Natural England, it is assumed that no additional costs will be incurred to operators to mitigate the impacts upon MCZ features (compared with what is required now in the absence of MCZs). Although the IA assumes that construction of infrastructure and drilling would be prohibited in rMCZ Reference Areas, DECC (pers. comm., 2012) has advised that it is unlikely that any future oil and gas (including CCS) activity would take place in any of the rMCZ Reference Areas based on where they are located in relation to existing oil and gas infrastructure.

F2.91 The present value of these costs to the sector is estimated to range from £0.070m (low cost estimate) to £0.096m (high cost estimate) over the 20-year period of the IA. The best estimate of the cost is arbitrarily assumed to be the mid-point between the low and high cost scenarios, which results in a present value of costs over 20 years of £0.083m.

F2.92 These costs only include those anticipated for future licence applications in blocks offered or awarded in the 26th Seaward Licensing Round. Only the assessment of national impact in the Evidence Base is updated to reflect the recently announced 27th Seaward Licensing Round. The impacts are predominantly associated with 11 rMCZs. This is considered to be the best estimate

of impact, as it is based on the advice of DECC, Natural England and JNCC. A breakdown of estimated costs by region is provided at Annex O.

F2.93 Oil & Gas UK and CCSA are concerned that additional costs could be incurred to operators to mitigate the impact of their activities upon MCZ features. They suggest that additional costs could be incurred if:

- pipelines need to be re-routed around MCZs (only MCZ Reference Areas for the oil and gas sector and all MCZs for the CCS sector);
- horizontal drilling to resources underneath MCZ Reference Areas is not allowed;
- additional mitigation of spills and leakages is required;
- additional costs for ongoing monitoring of the impact on MCZ features if this is a required licence condition.

3.10 Ports, harbours, shipping and disposal sites

Regional baseline summary

F2.94 There are over 80 ports and harbours along the coast of south-west England (Portland Port, pers. comm., 2011). These range from major international trading gateways, such as at Bristol, to small harbours with limited fixed infrastructure, such as Topsham. In order to fulfil their statutory duties, a number of ports and harbours in the region carry out regular maintenance dredging of navigation channels as well as maintenance and laying of berths, moorings, anchorages, lights and buoys. In addition, many ports and harbours carry out maintenance works to port and harbour infrastructure, new capital works to provide for expanding demand and services regulating the movement of vessels and other marine activities.

F2.95 The main port, harbour and shipping activities within 5km of an rMCZ are as follows:¹²

- expansion and/or redevelopment plans for Brixham, Falmouth and Ilfracombe harbours: such plans are generally driven by an increase in demand for existing activities resulting in a need for increased capacity, and/or as part of strategic investments which add to or realign the services provided by the port or harbour;
- navigational maintenance dredging by Axmouth Harbour Commissioners, Poole Harbour Commissioners and Padstow Harbour Commissioners and a navigational capital dredge planned by Falmouth Harbour Commissioners;
- disposal at sea of dredged material at disposal sites including Padstow Bay disposal site which overlaps with the Padstow Bay and Surrounds rMCZ. Other relevant disposal sites include Mounts Bay disposal site and Rame Head South dredge disposal sites which are situated less

¹² Buffer zones of 1km and 5km around each rMCZ have been used to identify ports and shipping activities which may impact on rMCZ features; these buffer zones may be needed to mitigate impacts (Natural England, pers. comm., 2011).

than 1km from rMCZs. A further 6 disposal sites are all situated between 1km and 5km from rMCZs, as is Bournemouth Beach which receives beach recharge material.

- Use of the Cross Roads Buoy for mooring large vessels in Falmouth Harbour. The buoy is adjacent to The Fal rMCZ Reference Area.

Regional summary of impacts

Source of costs

F2.96 Up to two management scenarios of ports, harbours and shipping sector activities were considered for individual rMCZs, which reflect the uncertainty of future management decisions. This summary of impacts of the south-west rMCZs is based on the following in order to provide the range of potential costs:

- lowest cost management scenario: the management scenario for each rMCZ that results in the lowest cost to the sector, including (i) increase in costs of assessing environmental impacts for future licence applications for activities within 1km of an rMCZ; (ii) costs of possible additional mitigation requirements (Padstow Bay disposal site; anchoring in reference areas)
- highest cost management scenario: the management scenario for each rMCZ that results in the highest cost to the sector, including (i) increase in costs of assessing environmental impacts for future licence applications within 5km of an rMCZ; (ii) costs of possible additional mitigation requirements (disposal sites, navigational capital dredging; port developments);.

F2.97 Further details on the specific management scenarios for any individual rMCZ are provided in Annex I.

Lowest cost management scenario impacts

F2.98 It is likely that future licence applications for navigational dredging, disposal at sea and harbour redevelopments within 1km of an rMCZ will need to consider the potential effects of the activity on achieving the conservation objectives of the MCZ's features. This will increase the costs to operators of carrying out the environmental assessments for licence applications. Sector activities will be affected by eight rMCZs (including one rMCZ Reference Area), and resulting increases in costs incurred each time a licence application is undertaken are estimated to average £0.022m/yr over the 20-year IA timeframe.

F2.99 It is assumed in the lowest cost scenario that additional mitigation of impacts from the disposal of dredged material is needed to achieve the conservation objective of features in the Padstow Bay and Surrounds rMCZ. This will result in disposal only occurring in the western half of the existing disposal site, which is outside the rMCZ, and is estimated to result in a £0.001m/yr increase in the costs of disposal for Padstow Harbour Commissioners. Prohibition of anchoring in rMCZ Reference Areas is discussed under 'recreation' later in this document.

F2.100 Over the 20-year timeframe of the IA, the present value of the direct costs under the lowest cost management scenario for the south-west rMCZs on ports, harbours, shipping and disposal sites is estimated to be £0.335m.

Highest cost management scenario impacts

F2.101 It is likely that future licence applications for navigational dredging, disposal at sea and harbour redevelopments within 5km of an rMCZ will need to consider the potential effects of the activity on achieving the conservation objectives of the MCZ's features. In some instances Maintenance Dredging Protocols (MDPs) documents may need to be updated or new ones created. This will increase the costs to operators of carrying out environmental assessments. Sector activities will be affected by at least 17 rMCZs (including one rMCZ Reference Area).

F2.102 Under the highest cost management scenario, activities close to The Fal rMCZ Reference Area may require additional mitigation including: (i) planned navigational capital dredging to occur only on out-flowing tides; relocation of the Cross Roads Buoy. This additional mitigation is estimated to result in a doubling of the baseline cost of the planned dredge, equating to a one-off cost of £24m (Falmouth Harbour Commissioners, pers. comm., 2011); (ii) because relocating the Cross Roads Buoy (in order to mitigate sediment deposition in the rMCZ Reference Area caused by vessels using the buoy) is not feasible, the IA assumes that use of the buoy will cease (Falmouth Harbour Commissioners, pers. comm., 2011). This is expected to reduce Port of Falmouth revenue generated by bunkering activities (supplying ships with fuel) during bad weather, receipt of ships in distress, and a contract with the Royal Fleet Auxiliary (RFA) (all of which rely on the continued use of the mooring buoy) by approximately £5.220m/yr (Falmouth Harbour Commissioners, pers. comm., 2011). This is expected to have knock-on effects on the local economy.

F2.103 The IA assumes that the additional mitigation for disposal of dredged material at Padstow Bay disposal site is the same for the highest cost scenario as for the lowest cost scenario. The additional mitigation will result in costs of £0.001m/yr to Padstow Harbour Commissioners. Under the highest cost management scenario, the present value of the net direct cost to the sector (net of substitution and displacement) over the 20-year timeframe of the IA is estimated to be between £25.402m and £25.444m.

Best Estimate of Costs

F2.104 The probability of each management scenario occurring is unknown. Therefore, the best estimate of the cost is assumed to be the mid-point between the lowest and highest cost scenarios, which results in a present value of costs over 20 years of £13.576m.

3.11 Recreation

Regional baseline summary

F2.105 Recreation activities take place in many of the rMCZs, with the heaviest concentration of activities and participation levels in those in coastal and estuarine locations.

F2.106 Recreational boating takes place in a number of rMCZs, with the most intensive activity in Studland Bay rMCZ and The Fal rMCZ Reference Area. At peak times, typically weekends during the summer months, between 105 (Boat Owners Response Group (BORG), pers. comm., 2011) and 210 (Dorset Wildlife Trust, pers. comm., 2009) boats may anchor in Studland Bay. The Fal rMCZ Reference Area overlaps with an area of the Carrick Roads used for racing. Approximately 250 race events took place in the Carrick Roads in 2011 (PoFSA, pers. comm., 2011). The rMCZ is also used by water sports training providers who anchor coaching and safety boats and lay course marks and operational markers within the rMCZ.

F2.107 Diving and snorkelling take place in a number of, typically coastal, rMCZs. One of the more popular locations is Lundy rMCZ Reference Area, which has at least 820 dive visits per year (Lundy wardens, pers. comm., 2011).

F2.108 Recreational angling by private individuals and charter operators takes place in a number of estuarine and coastal rMCZs and a small number of rMCZs further offshore. Wildfowling takes place in the Erme Estuary rMCZ Reference Area and The Fleet rMCZ Reference Area. Fossil collecting takes place in Lyme Bay rMCZ Reference Area.

Regional summary of impacts

Source of costs

F2.109 A single management scenario has been used for each rMCZ. With the exception of Studland Bay rMCZ, management scenarios for recreation activities apply only to rMCZ Reference Areas. For rMCZ Reference Areas, the scenarios include one or more of the following, depending on the activities present in the rMCZ:

- closure of rMCZ to anchoring;
- closure of rMCZ to recreational angling;
- closure of rMCZ to wildfowling;
- closure of rMCZ to fossil collecting.

F2.110 The management scenario for Studland Bay is: provision of eco-moorings and creation of no-anchor zones.

F2.111 Further details on the specific management scenario for any individual rMCZ are provided in Annex I.

Management scenario impacts

F2.112 In total, impacts to the recreation sector occur in nine rMCZs, eight of which are rMCZ Reference Areas. Six are used for angling, two for wildfowling and one for fossil collecting.

F2.113 Anchoring of vessels will be affected in four rMCZs, with Studland Bay rMCZ being the only one that is not an rMCZ Reference Area. In two rMCZ Reference Areas, Lundy and Erme Estuary, relatively small numbers of users are likely to be affected. However, the rMCZs will

significantly affect the ability of users to continue their activity and may have impacts on associated commercial revenues. In Studland Bay rMCZ and The Fal rMCZ Reference Area, a large number of recreational boaters are likely to be affected. In Studland Bay, the rMCZ will result in increased costs through the installation of eco-moorings (estimated capital costs of £0.433m) and a new requirement for boaters to pay for the use of these eco-moorings (estimated annual mooring charges of £0.090m). In The Fal, the rMCZ will result in a reduction in racing within the estuary, and a potential loss of between 7,000 and 12,000 race participant days. It is estimated that gross direct local expenditure associated with Falmouth racing could reduce by £0.572m/yr, which may have significant local economic impacts. Net of the effects of affected participants substituting expenditure to other locations and other activities, the net effect on UK GVA is estimated to be £0.067m/yr.. The rMCZ is also likely to affect the level of water sports training that takes place in the rMCZ. This may impact on the overall provision of water sports training due to the importance of the eastern shore of the Carrick Roads for safe activities in easterly winds.

F2.114 Six rMCZ Reference Areas will impact on recreational anglers. In general, the rMCZs will only close small areas and alternative angling marks are available in close proximity.

F2.115 Two rMCZ Reference Areas will impact on wildfowling activities. In both instances the rMCZs cover prime spots within a wider wildfowling area and are expected to significantly diminish the quality of the wildfowling offered, and may impact on commercial revenues from wildfowling. It was not possible to estimate quantitative costs.

F2.116 One rMCZ Reference Area, Lyme Bay, will affect fossil collectors. While thousands of fossil collectors are thought to visit the area each year, the rMCZ is small and is not situated in one of the more favourable areas for fossil collection. As such, the rMCZ is not expected to impact significantly on the number of fossil-related visitors, or on the quality of the experience of visiting the area (Lyme Regis Museum, pers. comm., 2011).

F2.117 Over the 20-year timeframe of the IA, the present value of net (of substitution effects) direct costs to the recreation sector of the south-west rMCZs is estimated to be £2.656m. The costs presented in this section are the costs to users and of relevant infrastructure. These costs may differ from the welfare costs associated with rMCZ management.

3.12 Renewable energy

Regional baseline summary

Wind energy

F2.118 There are no existing wind farms in the South-West. There are two planned wind farms from the UK Government's Round 3 licensing. One of these, the Atlantic Array wind farm, which is at the pre-planning application stage, overlaps the full extent of the North of Lundy rMCZ. Once fully operational, the wind farm is planned to have a production capacity of between 1,000MW and 1,390MW (RWE npower renewable, 2012). Following a revision of the plans for the windfarm, approximately 656km of inter-array cabling will run through the North of Lundy rMCZ, but the

export cable route will no longer be sought through Morte Platform rMCZ. It is anticipated that construction will begin in 2016 and be completed by 2019 (RWE Innogy, pers. comm., 2011).

Wave energy

F2.119 Wave Hub is the only existing wave energy development in the South-West, and it is approximately 15km from the nearest rMCZ. There is considerable wave resource potential in the South-West. Over the medium to long term, further developments are expected (DECC, pers. comm., 2011), the general locations of which are indicated by Potential Development Areas (PDAs) (PMSS, 2010). The actual wave energy installations are expected to require only a small fraction of the total area identified by each PDA. In total, seven PDAs have been identified in the South-West. Four of these overlap or are within 1km of the following rMCZs: Hartland Point to Tintagel, Newquay and the Gannel, Padstow and Surrounds, Cape Bank, Isles of Scilly, South of the Isles of Scilly and Land's End. For these PDAs, licence applications are expected over the period to 2030 for a total of four wave energy developments (DECC, pers. comm., 2011) with potential energy generation capacity of 1,220MW/yr (PMSS, 2010).

Tidal energy

F2.120 There are currently no existing tidal energy installations in the South-West. The Crown Estate recently granted a lease for a test site off the north coast of Devon (The Crown Estate, 2012), potentially within or adjacent to rMCZ Bideford to Foreland Point. Over the medium to long term, developments are expected (DECC, pers. comm., 2012), the general locations of which are indicated by PDAs) (PMSS, 2010). The actual wave energy installations are expected to require only a small fraction of the total area identified by each PDA. In total, four PDAs have been identified in the South-West, all of which overlap or are within 1km of one or more of the following rMCZs: Bideford to Foreland Point, Hartland Point to Tintagel, Lundy rMCZ Reference Area, Cape Bank, South Dorset, South Dorset rMCZ Reference Area and South-East of Portland Bill rMCZ Reference Area. For these PDAs and the test site, licence applications are expected over the period to 2030 for a total of five tidal energy developments (DECC, pers. comm., 2011) with potential energy generation capacity of 1,080MW/yr (PMSS, 2010). Although Lundy rMCZ Reference Area, South Dorset rMCZ and South Dorset rMCZ Reference Area all overlap PDAs, it is considered unlikely that any future development would overlap with the area of the rMCZs. It is also unlikely that any cables will need to pass through the rMCZs.

Regional summary of impacts

Source of costs

F2.121 In total three management scenarios were used; two for rMCZs, and one for rMCZ Reference Areas. The management scenarios for rMCZs:

- Management scenario 1: An increase in the costs of assessing environmental impacts for licence applications.
- Management scenario 2: An increase in the costs of assessing environmental impacts for licence applications and an increase in scour protection installation costs.

F2.122 The management scenario for rMCZ Reference Areas:

- Management scenario 1: Installation of renewable energy devices and cables not permitted within the rMCZ. Increase in costs of assessing environmental impacts for future licence applications within the vicinity 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).

Lowest cost management scenario impacts

F2.123 Costs of the rMCZs to the renewables sector under this scenario relate to an increase in the costs of assessing environmental impacts for licence applications. The licence applications for future tidal and wave energy installations and the planned Atlantic Array wind farm will 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 an additional one-off cost in the year the associated licence application is expected.

F2.124 The South-East of Portland Bill rMCZ Reference Area overlaps with one of the best areas of tidal resource on the south coast. Over the medium term, a tidal resource development is expected there due to the quality of the resource. It will not be permitted in the rMCZ, forcing any future proposal into an area of lower quality resource. This is likely to delay the point at which a viable development could be expected in this area. Based on resource data provided in PMSS (2010), a five-year delay is estimated. If cables routes are sought that pass through the rMCZ (the likelihood of which is not known), then additional costs may be incurred as a result of re-routing cable around the rMCZ.

F2.125 Over the 20-year timeframe of the IA, the present value of the costs to the renewable energy sector under the lowest cost management scenario is estimated to be £0.119m.

Highest cost management scenario impacts

F2.126 In addition to costs set out under Scenario 1, further costs may occur under Scenario 2 as a result of a requirement to use alternative cable protection methods for power export and inter-array cables in rMCZs.

F2.127 As the actual locations of potential wave and tidal installations are unknown, it is unclear whether any inter-array or export cables will be required to pass through the rMCZs, and if they are what length of cable may be affected. The marginal cost of this mitigation measure is estimated to be £1m/km of cable (average of wind energy developers, see Annex H14 for details) and as such the total mitigation cost could be significant. The likelihood of such mitigation being required is low, and where required it may only be needed over a part of the total length of cable within an rMCZ.

F2.128 For the Atlantic Array wind farm, additional costs may arise as a result of alternative methods for protecting inter-array cables. The cost such mitigation may be significant, estimated at

£1m/km, however the likelihood of it being required is low, and, if required, would only be over a small fraction of the total length of inter-array cable (Natural England, pers. comm., 2012). Given these uncertainties it has not been possible to estimate a cost of the potential mitigation.

F2.129 As the potential cost of alternative cable protection could not be costed, there is a small risk (given that the likelihood of the mitigation being required is low) that the costs presented under the high scenario for the Finding Sanctuary project area are an underestimate. Over the 20-year timeframe of the IA, the present value of the costs to the renewable sector under the highest cost management scenario is estimated to be £0.119m. As it has not been possible to estimate the potential costs of alternative cable protection, the quantified costs for scenarios 2 are the same as those for scenario 1.

Best Estimate

F2.130 As it has not been possible to estimate the potential increase in costs associated with increased mitigation under scenario 2, the cost estimates presented previously are the same for both scenarios. As such the best estimate is also the same, with a present value of costs over 20 years of £0.119m. Given the exclusion of potential cable protection mitigation costs under the highest cost scenario (as they are unknown), this best estimate is likely to be an under-estimate.

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