Value of the impact of Marine Protected Areas on recreation and tourism services

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Author(s)	Rocio Salado, Principal consultant, RPA Anthony Footitt, Principal consultant, RPA Rozi Goodbody, Researcher, RPA Chloe Elding, Researcher, RPA Jenny Miller, Researcher, RPA Richard Hart, RSSMarine Roger Morris, Bright Angel Coastal Consultants Dr Rob Blyth-Skyrme, Ichthys Marine Ecological Consulting
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Disclaimer

The views and propositions expressed herein are, unless otherwise stated, those of Risk & Policy Analysts and do not necessarily represent any official view of Defra or any other organisation mentioned in this report.

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Table of contents

Glossary

Choice experiment:	A survey technique where people are asked to choose between options with differing levels of variables, for instance price, distance and environmental quality. This enables researchers to identify willingness to pay for a given variable level.
Consumer surplus:	Consumer surplus is the monetary gain obtained by consumers because they are able to purchase a product for a price that is less than the highest price that they would be willing to pay.
Contingent valuation:	A survey technique where people are asked how much they would be willing to pay to achieve a certain outcome.
Discount rate:	The annual percentage rate at which the present value of a future pound, or other unit of account, is assumed to fall away through time.
Discounting:	The conversion of quantities which are distributed over time into today's money (by application of a discount rate based on a preferred rate of interest).
Displacement:	The degree to which an increase in tourism in one area is offset by decreases in tourism elsewhere.
Existence value:	The value placed by people on the continued existence of an asset for the benefit of present or future generations. The latter is sometimes referred to as bequest value. See also 'Use value'.
Hedonic pricing:	Deriving values by decomposing market prices into their constituent characteristics.
Informal recreation:	Informal recreation comprises of non-motorised activities which are easily accessible, require little or no previous experience and may include associated behaviour such as enjoyment of immediate surroundings and views, and relaxation or social discussion. The primary activities in this category are walking, bathing, rock-pooling and other beach recreation such as sand-castle building, picnicking and dog walking.
Non-use benefit/value:	The benefit associated with knowing the resource exists, for current and future generations.
Present value:	The future value expressed in present terms by means of discounting.
Recreation:	Recreation is defined as leisure activities done for enjoyment when one is not working. Many recreational activities will be enjoyed by local residents however tourists will generally take part in recreational activities as well while visiting the area and this may even be the main reason for their visit. The definition of recreation in this study includes both visits by local residents and tourists when engaging in leisure activities.
Revealed preference:	The inference of willingness to pay for something which is non-marketed by examining consumer behaviour in a similar or related market.
Sensitivity analysis:	Analysis of the effects on an appraisal of varying the projected values of important variables.

Stated preference:	Willingness to pay for something that is non-marketed, as derived from people's responses to questions about preferences for various combinations of situations and/or controlled discussion groups.
Switching value:	The value of an uncertain cost or benefit for which the best way to proceed would switch, for example from approving to not approving a project, or from including or excluding some extra expenditure to preserve some environmental benefit.
Tourism:	All activities of visitors including both "tourists (overnight visitors)" and "same-day visitors". To be classified as a "tourism day visit" a trip must: - Involve participation in leisure activities, including sports and other outdoor activities. - Have lasted at least three hours (including travel) - Not be an activity which is undertaken "very regularly" - Be in a destination outside the respondent's place of residence (or place of work if this was the start point of the trip). The exceptions to this are trips to special public events, live sporting events and visitor attractions.
Travel cost:	The cost involved in undertaking a trip, including, for instance petrol, accommodation, entry fees and the value of the individual's time.
Uncertainty:	The condition in which the number of possible outcomes is greater than the number of actual outcomes and it is impossible to attach probabilities to each possible outcome.
Use benefit/value:	The benefit associated with using the resource.
Willingness to accept:	The amount that someone is willing to receive or accept to give up a good or service.
Willingness to pay:	The amount that someone is willing to give up or pay to acquire a good or service.

Accronyms

AONB	Areas of Outstanding Natural Beauty
AT	Angling Trust
BMF	British Marine Federation
BSAC	British Sub Aqua Club
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CS	consumer surplus
cSAC	Candidate Special Area of Conservation
EUNIS	European Nature Information System
FTE	Full Time Equivalent jobs
GBDVS	Great Britain Day Visit Survey
GIS	Geographic information system
IFCA	Inshore Fisheries and Conservation Authorities
IUCN	International Union for Conservation of Nature
LNR	Local Nature Reserve
MCPA	Marine and Coastal Protected Areas
MCZ	Marine Conservation Zone
MENE	Monitor of Engagement with the Natural Environment
MNR	Marine Nature Reserve
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
NEA	National Ecosystem Assessment
NGOs	Non-governmental organizations
NNR	National Nature Reserve
NOAA	National Oceanic and Atmospheric Administration
NPV	Net present value
NTZ	No-Take Zone

pppd	per person per day
rMCZs	recommended Marine Conservation Zone
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SCUBA	Self-contained underwater breathing apparatus
SLR	Sea level rise
SMP	Shoreline Management Plan
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest
TCM	travel cost method
TDV	Tourism Day Visits
RNLI	Royal National Lifeboat Institution
RYA	Royal Yachting Association
TDA	Tourism Development Agency
UKCIP	UK Climate Impacts Programme
UNEP	United Nations environment programme
UTM	Universal Transverse Mercator
WTP	Willingness to pay
WWF	World Wide Fund for Nature

Executive summary

Introduction

This report presents the case studies tested against the methodology developed for the valuation of the recreational and tourism benefits following MCZ designation. The methodology is set out in a separate document, with the title: **Value of the impact of Marine Protected Areas on recreation and tourism services, Methodology report,** and can be provided upon request. The methodology includes the details and justifications of the underlying assumptions supporting the assessment of impacts in this report[1].

The cases studies are first evaluated in qualitative terms against the level of usage, facilities and the level of promotion and categorised as follows:

1. Type 1 site: a site that is actively used for tourism and recreation and could be considered a "honeypot site". A honeypot is a particularly popular attraction which attracts tourists (and sometimes locals) in large numbers and where tourism is a significant contribution to the local economy.

2. Type 2 site: a site that is actively used for tourism and recreation but it is not considered to be a honeypot. The site does not attract visitors in large numbers. The site has some facilities available but they may not operate throughout the year.

3. Type 3 site: a site which is not actively used for tourism and recreation but has potential to grow recreational activities. Potential to develop the activities should consider aspects such as additional promotion and/or investment in facilities (e.g. provision of car parks, toilets, improved access, etc.).

4. Type 4 site: a site which is unlikely to be accessible by shore and subject to restrictions on recreation (no navigation area, no anchoring or mooring). This site is more likely to relate to offshore sites where recreational activities do not currently take place. Due to the difficulty of access to these sites and the limited recreational benefits expected from designation, no type 4 sites have been included among our case studies.

The case studies chosen demonstrate a variety of level of activity and regional spread thus covering different uses and typology of sites.

[1] The methodology has been used to inform the revised Impact Assessment for the designations of MCZs but does not address the estimation of costs of management measures and/or costs to recreational users and the tourism industry from designation and management.

Findings of the case studies

Table 1 summarises the findings of the case studies including the monetary estimates of the benefits, undiscounted. The analysis has been based on the SNCB advice of features, conservation objectives and potential management scenarios correct at the time of the MCZ consultation for the Impact Assessment (as reported in Defra, 2012). Advice from SNCBs may have changed since then, based on new information or surveys, however it has not been possible to incorporate any changes in time for this analysis.

Although efforts have been made to produce estimates of the right order of magnitude, erring on the side of caution, the main caveats are as follows:

1. Baseline definition: figures reported from StakMap[2] on level of usage appear to be low in most cases, particularly for the North West (Cumbria Coast case study). As StakMap was a survey of a sample of users, it will systematically underestimate activity levels. Validation of the data for the North West revealed that the data only covered 55% of sea angling clubs in the north west of England and 78% of known sea anglers to Defra (Pers. Comm[3], 2013). No other validations have been undertaken. Consultation, internet searches and additional literature have been used to support the estimates and in some cases alter the figures. Other figures may need further validation;

2. Assessment of Impact
    a. The average number of visits per user per year is taken from a recent survey of divers and recreational anglers, provided to the consultants[4], and the Water Sport Participation Surveys[5] for other recreational categories. While the former survey provided the best estimates to date on participation frequencies (as based on the specific rMCZs considered under this study), the estimates for other recreational categories may not be that accurate (as it may provide participation across a range of sites) thus may need increasing or decreasing according to specific site characteristics;
    b. The estimates have assumed a moderate % increase of visitation of 5-10% per year across all users within a recreational category when this is affected by designation (following promotion and perception aspects mainly, although conservation gains may play a part in the longer term). Assuming % increases across all users within an affected recreational category may overestimate the number of additional visits by recreational category (on the other hand it may capture new visits by new users that

[2] StakMap data are available on the MMO marine planning portal.

[3] Fran Moore, BV, 2013.

[4] As part of the study by Kenter, J.O., Bryce, R., Davies, A., Jobstvogt, N., Watson, V., Ranger, S., Solandt, J.L., Duncan, C., Christie, M., Crump, H., Irvine, K.N., Pinard, M., Reed, M.S. (2013). The value of potential marine protected areas in the UK to divers and sea anglers. UNEP-WCMC, Cambridge, UK. Available at: http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=3N0cTcLt%2fDU%3d&tabid=82

[5] Arkenford (2012): Watersports Participation Survey, for BMF, RYA, MCA, RNNI, BCU and MMO. Available at http://www.dft.gov.uk/mca/watersports_participation_survey_2012_-_executive_summary.pdf.

may go unaccounted for). The estimates are however conservative and based on a very few studies reporting increased visitation by coastal users of 20% following improved access to a beach in Ireland[6] and following World Heritage Site designation[7]. Further research is needed on how designation may affect visitor numbers and visit frequency;

c. The recreational benefits are calculated as additional spend on travel costs following designation and increases in visits. The approach is thus based on revealed preferences, with the underlying assumption that the visitation will increase following designation. Pivot tables from the MENE survey[8] have been created to the nearest coastal geographical unit (town, local authority and/or region). In most cases the estimates appear to be on the low side, thus potentially underestimating the benefits. It is also worth noting that samples may be small in some cases, so any estimates should be read with caution;
d. Where possible, the above estimates have been complemented by consumer surplus gains from additional visits and improvements in conservation status, using a benefit transfer approach. Consumer surplus measures the monetary benefit to the user as the difference between what they would be willing to pay and what they actually pay on travel cost and tourism, accounting for the potential that users may gain additional welfare above the spend (as measured by consumer surplus). However, the sparse availability of studies reporting consumer surplus for recreational activities means that this approach has not been possible for all relevant recreation activities. Therefore, the total benefits may be underestimated; and
e. Estimates of tourism benefits have been based on additional spend other than travel related, as reported in MENE (to the nearest geographical unit). As above, this may undervalue or overvalue the total tourism benefits from designation.

As a result, any estimates should be treated with caution. A track of assumptions is provided in the tables and assumptions have been tested for sensitivity analysis. Confidence assessments are provided which are based on expert option. Consultation has been undertaken to sense-check some of the figures concerning visitor levels and adapted from StakMap when considered appropriate.

Case study sites

Torbay is a type 1 site, i.e. a honeypot. Because Torbay is considered to be a type 1 site, the impacts from designation may not be considered to be as significant (as the site already carries a significant

[6] Barry (2011): Improving the recreational value of Ireland's coastal resources: A contingent behavioural application, Marine Policy, 35 (2011) 764-771

[7] Kayahan (2010) estimated a 6.2% increase in tourist visitation following the designation of WHS. Although consultation has been undertaken for this review on the impacts of the Waden Sea WHS designation on recreation and tourism, little information has been collected on this at the time of writing.

[8] Natural England (2012): Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment, Technical Report (2011-12 survey), Natural England and raw data available at: http://publications.naturalengland.org.uk/publication/2350510?category=47018

recreational and tourism value). However, our sensitivity analysis has revealed a high sensitivity of the benefits to visitor numbers. This highlights the importance of validating baseline numbers concerning the number of users (as figures reported by StakMap appear to underestimate the number of participants in different recreational uses, particularly diving).

Recreational benefits are expected to be of a significant nature for the Stour and Orwell case study. The benefits are linked to both informal recreation[9] and angling. The site is categorised as a type 2 site and the level of facilities under the baseline are regarded to be medium. The site is popular among anglers which may increase the frequency of visitation following improvements in conservation status, facilities and promotion. The site has close ecological links with the Hamford Water and Mid-Essex Coast SPAs. Three of the 31 sites put forward for designations in 2013 are nearby, these are the Blackwater, Roach and Colne Estuaries (approximately 26 miles from Ipswich to Brightlingsea). Therefore the number of alternative sites is considered to be moderate and some displacement is likely (this will represent a transfer in some of the additional expenditure from one location to another). Our sensitivity analysis has revealed that the consideration of displacement for new visits may have a significant effect on the value of benefits. The inclusion of consumer surplus can influence the total estimates to a significant degree. Conservative estimates of benefits excluding consumer surplus are provided under the sensitivity analysis.

The Tamar Estuary rMCZ is also categorised as a type 2 site. The site is popular for informal recreation and water sports, particularly sailing and paddle sports, although the reported number of informal recreation visits to the estuary is lower than of Stour and Orwell. Designation is not expected to improve the level of access and facilities significantly as the level of provision is already good. However, the number of visits from existing users may increase following designation and displacement impacts are not expected to be significant (as Whitsand and Looe Bay is likely to attract visitors too following its designation as an MCZ). There will be tourism benefits from an increased number of visits of existing users (although the estimates produced are believed to be low due to small expenditure reported in the MENE survey).

Folkestone Pomerania is a type 3 site. Despite access being limited, it is a very popular site for divers and anglers. Recreational benefits are expected to be particularly relevant for these groups (as based on significant travel costs). Designation of Folkestone Pomerania is likely to lead to an increase in visitation but this may be due to a transfer of visitors from offshore sites that are currently popular for diving and angling within the same local area.

Finally, Cumbria Coast is classified as a type 2 site. The benefits in Cumbria Coast are expected to arise from birdwatchers and informal recreation users. The level of angling at the site is recorded to be low. Benefits are expected to accrue due to promotion and an improvement in access and facilities, probably complemented by the Copeland Borough Council's coastal work programme. This is more likely to increase the number of visits. Due to the presence of alternative sites nearby it is

[9] Informal recreation comprises of non-motorised activities which are easily accessible, require little or no previous experience and may include associated behaviour such as enjoyment of immediate surroundings and views, and relaxation or social discussion. The primary activities in this category are walking, bathing, rock-pooling and other beach recreation such as sand-castle building, picnicking and dog walking.

likely that many new users to the rMCZ site of Cumbria Coast will be transfers from others sites. Genuine new users from elsewhere are also likely but they will not contribute a significant number of visits. Tourism benefits are expected to accrue but due the low estimates of expenditure these are reported to be moderate in nature (thus likely to underestimate total benefits[10]).

Table 1 presents the benefits discounted for the four case study sites, including consumer surplus.

Table 1: Discounted total benefits for case studies over 20 years (Net Present Value @3.5% discount rate)

Case study site (rMCZ)	Type of site	Low estimate	Upper estimate	Assumptions
Torbay	1	£555,000	£1,048,000	Benefits to divers will arise in year 4, based on the recovery of sea grass bed and there may be some noticeable impacts on the population of sea horses but with maximum benefits being achievable in year 10; Benefits to anglers and wildlife watchers are not expected to be noticeable until year 8 and reach maximum benefits at year 15 from designation and implementation of management measures.
Stour and Orwell	2	£1,885,000	£5,241,000	Informal recreational benefits are assumed to start in year 3 following promotion and improvements of facilities and maximum benefits are expected to arise in year 6; Benefits to birdwatchers and recreational anglers are expected to arise in year 8, following habitat improvements and reach a maximum in year 15.
Tamar Estuary	2	£976,000	£1,951,000	Informal recreational benefits are assumed to start in year 3 following promotion and improvements of facilities and maximum benefits are expected to arise in year 6; Benefits to anglers are not expected to be noticeable until year 8 and reach maximum benefits at year 15 from designation and implementation of management measures.
Folkestone Pomerania	3	£205,000	£371,000	Benefits to divers will arise in year 4, based on the recovery of blue mussel beds but with maximum benefits being achievable in year 8; Benefits to anglers are not expected to be noticeable until year 8 and reach maximum benefits at year 15 from designation and implementation of management measures.
Cumbria Coast	2	£145,000	£288,000	Informal recreational benefits are assumed to start in year 3 following promotion and improvements of facilities and maximum benefits are expected to arise in year 6; Benefits to wildlife watchers, anglers and rock-pooling are not expected to be noticeable until year 8 and reach maximum benefits at year 15 from designation.

[10] The need for a new marine landing facility at the new nuclear power station at Sellafield was identified in 2011 but it is not anticipated for at least 5 years. This could impact the benefits to recreational uses negatively. This aspect could be part of scenario testing for longer timeframes than 20 yrs.

Table 2:	Total benefits for case studies over 20 years (Net Present Value @3.5% discount rate)						
Case study site (rMCZ)	Type of site	Recreational benefits		Tourism benefits		Main users affected	Confidence level – summary of assumptions
		Lower estimate	Upper estimate	Lower estimate	Upper estimate		
Torbay	Type 1	£414,000	£767,000	£141,000	£282,000	Recreational anglers, divers and wildlife watchers	**Low- Underestimate.** The approach is based on additional travel expenditure from increased visitation and a moderate level of impact on anglers, divers and wildlife watchers. The number of new users is considered to be small as the site is already popular for its many designations and known as a honeypot (additional promotion and services with minimal effect). Values are highly sensitive to estimates on number of users.
Stour and Orwell	Type 2	£1,757,000	£4,870,000	£128,000	£370,000	Informal recreation and recreational angling	**Low/moderate**- The site is popular among walkers and recreational anglers. Although sailing is also an important activity, this type of activity is already well-known with numerous marinas and boat yards. There may be new visitors from additional promotion; displacement is assumed for birdwatching but benefits are highly sensitive to this type of impact as well as the inclusion of gains in consumer surplus. *Benefits may be overestimated if displacement proved to be greater than 30%.*
Tamar Estuary	Type 2	£850,000	£1,696,000	£128,000	£256,000	Informal recreation	**Low- Underestimate.** The site is popular for informal recreation and water sports, excluding diving. Designation is not expected to improve the level of access and facilities significantly. There may be new users but displacement not expected to be significant. There will be tourism benefits (estimates are believed to be low due to small expenditure reported).
Folkestone Pomerania	Type 3	£190,000	£342,000	£14,000	£29,000	Divers, recreational anglers	**Low- Underestimate.** The site is popular among divers and recreational anglers; benefits to conservation may lead to increased frequency of visitation. This site is not coastal, so no informal recreation benefits are expected. Due to the presence of alternative sites nearby it is likely that many new users to the rMCZ site of Folkestone Pomerania will be transfers from others sites. There is uncertainty regarding the number of divers and the estimates are sensitive to assumption on these.
Cumbria Coast	Type 2	£124,000	£245,000	£21,000	£43,000	Informal recreation, wildlife watchers, rock-poolers	**Low/moderate – Underestimate**. The site is very popular among informal recreational users but does not have many facilities. There will be benefits from additional spend by informal recreational users and birdwatchers, thus benefits may be significantly underestimated if promotion and designation improved perceptions and increased the number of overnight visitors.

A summary of discounted benefits over 20 years per km^2 for each case study and recreational use is provided in Table 3.

Table 3: Benefits per km^2 (NPV over 20 years @3.5% - £/km2)		
Site type/rMCZ	**Lower bound**	**Upper bound**
Type 1: Torbay		
Recreational benefits		
Recreational angling	£17,912	£32,713
Diving/snorkelling	£267	£533
Wildlife watching	£2,546	£5,092
Tourism benefits		
Recreational sea angling	£2,262	£4,524
Diving/snorkelling	£453	£906
Wildlife observation	£4,328	£8,656
Type 2: Stour and Orwell		
Recreational benefits		
Informal recreation	£16,198	£48,595
Wildlife watching	£560	£1,119
Recreational angling	£3,432	£6,268
*Tourism benefits**		
Informal recreation	£1,305	£3,914
Wildlife watching	£62	£124
Recreational angling	£108	£217
Type 2: Tamar Estuary		
Recreational benefits		
Informal recreation	£56,001	£112,003
Recreational angling	£634	£1,081
*Tourism benefits**		
Informal recreation	£8,514	£17,029
Recreational angling	£13	£25
Type 3: Folkestone Pomerania		
Recreational benefits		
Diving	£510	£1,020
Recreational angling	£5,082	£9,051
Tourism benefits		
Diving	£0	£0
Recreational angling	£425	£850
Type 2: Cumbria coasts		
Recreational benefits		
Informal recreation	£6,843	£13,686
Wildlife observation (bird watching)	£69	£138
Rock-pooling	£114	£228
Recreational angling	£367	£618
Tourism benefits		
Informal recreation	£1,187	£2,373
Wildlife watching)	£47	£94
Rock-pooling	£78	£156
Recreational angling	£19	£38
* Other tourism benefits from recreational categories considered very small and/or not enough evidence to estimate impacts		

Extrapolation from the case studies to 1st tranche of rMCZ

The case studies have been used to extrapolate across the first tranche of rMCZ as based on the values given in Table 3.

In order to extrapolate to the other sites, the NPV benefits calculated in the case studies (recreational and tourism) for each recreational category have first been divided by the site area to provide benefits per km^2. For each recreational category, these data have been further divided by data on the number of users (from StakMap). For each recreational category, this provides a value (NPV) expressed per km^2 per user[11].

Where possible, the case studies were selected to provide values for a range of different sites. The next step in the extrapolation was to determine which set of values should apply to which case study. This was determined by consideration of:

- The type of site (1,2,3 or 4); and
- The nature of the site (coastal, estuarine, inshore, offshore).

In this way, different case study values were assigned to each of the other sites. In the case of offshore sites (which are almost certainly also type 4 sites), it has been assumed that there will be no recreational benefits. The lack of data for some Type 3 sites has made valuation unfeasible.

These values were then aggregated on the basis of site area to provide total values for each activity. The results of the extrapolation are given in Table 4. The total benefits across all sites (30 rMCZs) discounted over 20 years (@3.5%) are estimated to range between the following values, including consumer surplus:

- Recreational benefits:
    - Lower bound: c£40.4m
    - Upper bound: c£82.9m
- Tourism benefits:
    - Lower bound: c£5.1m
    - Upper bound: c£10.17m

Table 5 summarises the results of the sensitivity of the recreational benefits across all sites when excluding consumer surplus (NB: Benefits to tourism in this case remain unchanged). As shown, the recreational benefits, discounted, are significantly reduced down to:

- Lower bound: c£20.7m
- Upper bound: c£43.6m

[11] In the case of informal recreation, there are no data from StakMap and, as such, the per km^2 values are left as per km^2.

Table 4: Site categorisation and estimated benefits per rMCZ (includes consumer surplus)							
rMCZ	Regional Project	Site Type	Inshore: within 12 nm (incl. Coastal: up to 1nm, Estuarine) Offshore: >12 nm	Lower Bound Benefits (£)		Upper bound Benefits (£)	
				Recreational	Tourism	Recreational	Tourism
Torbay	Finding Sanctuary	Type 1	Coastal	£414,000	£141,000	£767,000	£282,000
Stour and Orwell Estuaries	Balanced Seas	Type 2	Coastal	£1,757,000	£128,000	£4,870,000	£370,000
Folkestone Pomerania	Balanced Seas	Type 3	Inshore	£190,000	£14,000	£342,000	£29,000
Tamar Estuary Sites	Finding Sanctuary	Type 2	Estuarine	£850,000	£128,000	£1,696,000	£256,000
Cumbria Coast	Irish Sea Conservation Zone	Type 2	Coastal	£124,000	£21,000	£245,000	£43,000
Chesil Beach and Stennis Ledges	Finding Sanctuary	Type 2	Coastal	£1,458,000	£86,000	£2,998,000	£198,000
East of Haig Fras	Finding Sanctuary	Type 4	Inshore	£0	£0	£0	£0
Isles of Scilly	Finding Sanctuary	Type 1	Inshore	£119,000	£198,000	£238,000	£395,000
Padstow Bay and Surrounds	Finding Sanctuary	Type 1	Coastal	£240,000	£310,000	£469,000	£619,000
Poole Rocks	Finding Sanctuary	Type 3	Inshore	£589,000	£48,000	£1,052,000	£97,000
Skerries Bank and Surrounds	Finding Sanctuary	Type 2	Coastal	£3,136,000	£322,000	£8,241,000	£806,000
South Dorset	Finding Sanctuary	Type 3	Inshore	£335,000	£28,000	£597,000	£56,000
Southwest Deeps (West)	Finding Sanctuary	Type 4	Offshore	£0	£0	£0	£0
The Canyons	Finding Sanctuary	Type 4	Offshore	£0	£0	£0	£0
The Manacles	Finding Sanctuary	Type 2	Coastal	£107,000	£7,000	£232,000	£17,000
Upper Fowey and Pont Pill	Finding Sanctuary	Type 2	Estuarine	£173,000	£18,000	£328,000	£36,000

Table 4: Site categorisation and estimated benefits per rMCZ (includes consumer surplus)							
rMCZ	Regional Project	Site Type	Inshore: within 12 nm (incl. Coastal: up to 1nm, Estuarine) Offshore: >12 nm	Lower Bound Benefits (£)		Upper bound Benefits (£)	
				Recreational	Tourism	Recreational	Tourism
Whitsand and Looe Bay	Finding Sanctuary	Type 2	Coastal	£1,531,000	£100,000	£3,277,000	£235,000
Blackwater, Crouch, Roach and Colne Estuaries	Balanced Seas	Type 2	Estuarine	£19,763,000	£2,650,000	£38,733,000	£5,301,000
Medway Estuary	Balanced Seas	Type 1	Estuarine	£4,104,000	£563,000	£8,071,000	£1,125,000
Thanet Coast	Balanced Seas	Type 1	Coastal	£1,031,000	£130,000	£1,883,000	£260,000
Beachy Head West	Balanced Seas	Type 2	Coastal	£1,344,000	£71,000	£2,646,000	£157,000
Kingmere	Balanced Seas	Type 2	Coastal	£2,063,000	£117,000	£4,182,000	£266,000
Pagham Harbour	Balanced Seas	Type 2	Coastal	£41,000	£4,000	£105,000	£10,000
Hythe Bay	Balanced Seas	Type 1	Coastal	£650,000	£92,000	£1,189,000	£184,000
Aln Estuary	Net Gain	Type 2	Estuarine	£27,000	£3,000	£52,000	£7,000
Rock Unique	Net Gain	Type 4	Offshore	£0	£0	£0	£0
Swallow Sand	Net Gain	Type 4	Offshore	£0	£0	£0	£0
North of Celtic Deep	Irish Sea Conservation Zone	Type 3	Offshore	£0	£0	£0	£0
Fylde Offshore	Irish Sea Conservation Zone	Type 3	Offshore	£0	£0	£0	£0
Hilbre Island Group	Irish Sea Conservation Zone	Type 2	Inshore	£379,000	£19,000	£728,000	£40,000
Total Benefits (all rMCZs)				**£40,425,000**	**£5,198,000**	**£82,941,000**	**£10,789,000**

Table 5: Site categorisation and estimated benefits per rMCZ (excludes consumer surplus)							
rMCZ	Regional Project	Site Type	Inshore: within 12 nm (incl. Coastal: up to 1nm, Estuarine) Offshore: >12 nm	Lower Bound Benefits (£)		Upper bound Benefits (£)	
				Recreational	Tourism	Recreational	Tourism
Torbay	Finding Sanctuary	Type 1	Coastal	£282,000	£141,000	£565,000	£282,000
Stour and Orwell Estuaries	Balanced Seas	Type 2	Coastal	£685,000	£128,000	£1,994,000	£370,000
Folkestone Pomerania	Balanced Seas	Type 3	Inshore	£95,000	£14,000	£190,000	£29,000
Tamar Estuary Sites	Finding Sanctuary	Type 2	Estuarine	£605,000	£128,000	£1,210,000	£256,000
Cumbria Coast	Irish Sea Conservation Zone	Type 2	Coastal	£31,000	£21,000	£62,000	£43,000
Chesil Beach and Stennis Ledges	Finding Sanctuary	Type 2	Coastal	£209,000	£86,000	£555,000	£198,000
East of Haig Fras	Finding Sanctuary	Type 4	Inshore	£0	£0	£0	£0
Isles of Scilly	Finding Sanctuary	Type 1	Inshore	£118,000	£198,000	£236,000	£395,000
Padstow Bay and Surrounds	Finding Sanctuary	Type 1	Coastal	£217,000	£310,000	£434,000	£619,000
Poole Rocks	Finding Sanctuary	Type 3	Inshore	£270,000	£48,000	£539,000	£97,000
Skerries Bank and Surrounds	Finding Sanctuary	Type 2	Coastal	£1,126,000	£322,000	£3,149,000	£806,000
South Dorset	Finding Sanctuary	Type 3	Inshore	£150,000	£28,000	£301,000	£56,000
Southwest Deeps (West)	Finding Sanctuary	Type 4	Offshore	£0	£0	£0	£0
The Canyons	Finding Sanctuary	Type 4	Offshore	£0	£0	£0	£0
The Manacles	Finding Sanctuary	Type 2	Coastal	£20,000	£7,000	£55,000	£17,000
Upper Fowey and Pont Pill	Finding Sanctuary	Type 2	Estuarine	£82,000	£18,000	£165,000	£36,000

Table 5: Site categorisation and estimated benefits per rMCZ (excludes consumer surplus)							
rMCZ	Regional Project	Site Type	Inshore: within 12 nm (incl. Coastal: up to 1nm, Estuarine) Offshore: >12 nm	Lower Bound Benefits (£)		Upper bound Benefits (£)	
				Recreational	Tourism	Recreational	Tourism
Whitsand and Looe Bay	Finding Sanctuary	Type 2	Coastal	£268,000	£100,000	£722,000	£235,000
Blackwater, Crouch, Roach and Colne Estuaries	Balanced Seas	Type 2	Estuarine	£12,372,000	£2,650,000	£24,744,000	£5,301,000
Medway Estuary	Balanced Seas	Type 1	Estuarine	£2,633,000	£563,000	£5,267,000	£1,125,000
Thanet Coast	Balanced Seas	Type 1	Coastal	£651,000	£130,000	£1,302,000	£260,000
Beachy Head West	Balanced Seas	Type 2	Coastal	£149,000	£71,000	£383,000	£157,000
Kingmere	Balanced Seas	Type 2	Coastal	£273,000	£117,000	£718,000	£266,000
Pagham Harbour	Balanced Seas	Type 2	Coastal	£14,000	£4,000	£38,000	£10,000
Hythe Bay	Balanced Seas	Type 1	Coastal	£413,000	£92,000	£826,000	£184,000
Aln Estuary	Net Gain	Type 2	Estuarine	£16,000	£3,000	£33,000	£7,000
Rock Unique	Net Gain	Type 4	Offshore	£0	£0	£0	£0
Swallow Sand	Net Gain	Type 4	Offshore	£0	£0	£0	£0
North of Celtic Deep	Irish Sea Conservation Zone	Type 3	Offshore	£0	£0	£0	£0
Fylde Offshore	Irish Sea Conservation Zone	Type 3	Offshore	£0	£0	£0	£0
Hilbre Island Group	Irish Sea Conservation Zone	Type 2	Inshore	£35,000	£19,000	£88,000	£40,000
Total Benefits (all rMCZs)				**£20,714,000**	**£5,198,000**	**£43,576,000**	**£10,789,000**

1 Introduction

1.1 Overview

This case study report presents a number of case studies that have been tested against the methodology developed under the project.

The case studies were agreed at a steering group meeting held in February. The approach to case study selection was to select case studies that would vary in character, including level of use, level of management and regional split so they could be used to extrapolate across the whole of the 31 sites selected under the first tranche.

The case studies are:

- Torbay;
- Stour and Orwell;
- Tamar Estuary;
- Folkestone Pomerania; and
- Cumbria Coast.

These are presented below. There are a number of issues that should be considered when reading the case studies:

a) The case studies represent the benefit related to designation and do not aim to value the recreational value of the sites under the baseline;
b) The benefits are related to the increased visit numbers stemming from three main aspects, i.e. changes in conservation value, changes in facilities and changes in marketing following designation (NB: the cumulative impacts on conservation from designating a network of sites is not considered, which may underestimate the benefits in this regard);
c) Estimates of visitor numbers are based on the best available data to date, i.e. StakMap and MENE, but further consultation has been undertaken to sense-check the values (with numbers being corrected when more accurate information has been provided).

As a result, the estimates should be read with caution. Further validation may be needed but this may be prioritised according to costs estimates of designation for each of the individual sites.

1.2 Structure of the report

Each case study follows the different stages set out in the methodology, comprising the following steps:

1. **Stage 1: Baseline definition**, including the following steps
   1.2 Step 1.1: Define recreational uses and tourism activity

1.3 Step 1.2: Define conflicts among users (recreational and non-recreational uses)

1.4 Step 1.3: Summary of recreational and tourism value under baseline

2. **Stage 2: Screening the impacts** from designation and management on recreation and tourism, aimed at establishing whether impacts are likely

2.2 Step 2.1: Impacts on recreation from changes in the environment

2.3 Step 2.2: Impacts from management on recreational activities

2.4 Step 2.3: Impact on recreation from improvements in services to visitors (increased access and facilities)

2.5 Step 2.4: Impact on recreation from additional promotion

2.6 Step 2.5: Impact on tourism

2.7 Step 2.6: Summary of the screening

3. **Stage 3: Impact evaluation** from designation and management **on recreation**, based on the impact screening for the impacts identified in stage 2 and aims to provide a qualitative description first, moving to quantitative evaluation when impacts are considered moderate to significant:

3.2 Step 3.1: Assessing the impacts on existing users[12]

3.3 Step 3.2: Assessing the impacts on new users[13]

3.4 Step 3.3: Summary of recreational benefits including sources of uncertainty

4. **Stage 4: Impact evaluation** from designation and management on **tourism.** This stage is aimed at assessing the impacts from activities that generate revenue to the local economy, divided into the following steps:

4.2 Step 4.1: Qualitative assessment of impacts

4.3 Step 4.2: Quantitative assessment of impacts

4.4 Step 4.3: Monetary assessment of impacts

4.5 Step 4.4: Summary of tourism benefits including sources of uncertainty

5. **Stage 5: Discounting[14] and sensitivity analysis.** This step is aimed at testing the main sources of uncertainty which have been recorded throughout the process.

[12] Potential impacts on existing users may include factors such as enhanced visitor experience and increased visitation frequency. Displacement impacts are considered by taking account of similar sites nearby.

[13] For certain sites it is expected that designation may attract new visitors. However, this depends on many factors such as the current popularity of the site, potential for displacement, current capacity of the site, etc.

2 Torbay

2.1 Stage 1: Baseline definition

The Torbay rMCZ boundary proposed in the MCZ consultation IA[15] mainly follows the boundary of the Torbay section of Lyme Bay and Torbay candidate Special Area of Conservation (cSAC). This extends from the coastline to depths of approximately 30 metres and overlaps with Sites of Scientific Interest (SSSIs) in the area, the English Riviera Global Geopark and Berry Head National Nature Reserve. The rMCZ intersects a mapped area of higher than average benthic species and habitat diversity. Local group feedback has highlighted the sea caves present in and around Torbay (though reefs and sea caves are protected by the SAC designation).

There is an important wintering bird roost at Broadsands and the second most important area for wintering diver and grebe concentrations in the south west. The area, in particular around Berry Head, is important for sea birds. Species making up the assemblage include wintering divers and grebes (including black-throated diver *Gavia arctica*, great northern diver *Gavia immer*, great crested grebe *Podiceps cristatus* and breeding guillemot *Uria aalge)*.

At the time of consultation, proposed designation was based on the protection of bedrock reef, biogenic reef and sea cave features and the related flora and fauna those features support, including sea squirts, sponges, anemones, corals, sea fans and bryozoans, some of which include erectile species.

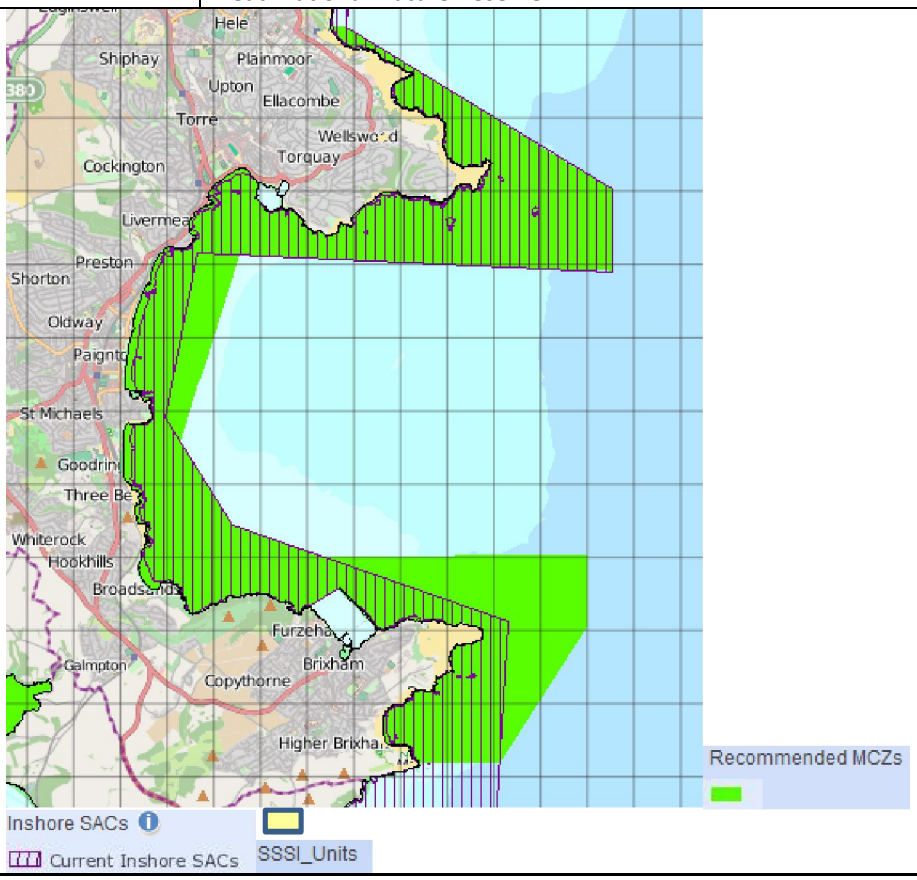
Table 2-1 sets out some basic information for Torbay.

Table 2-1:	**Basic information about rMCZ**	
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Area	20km^2	
Location	Inshore	
Overlaps with existing MPA (SPAs, SACs, SSSIs, RAMSAR sites)	International Designations	
	Current Inshore SAC	The majority of the site overlaps Lyme Bay and Torbay SAC.
	National Designations	
	SSSI	The Torbay rMCZ overlaps or borders with multiple Sites of Special Scientific Interest: (Babbacomb Cliffs, Hope's Nose to Walls Hill, Meadfoot Sea Road, Daddyhole, Dyers Quarry, Roundham Head, Saltern Cove, Berry Head to Sharkham Point
	Other	The Torbay rMCZ overlaps English Riviera Global Geopark and Berry

[14] The conversion of quantities which are distributed over time into today's money (by application of a discount rate based on a preferred rate of interest). A 20 year timeframe has been used for discounting and the discount rate is 3.5%.

[15] Defra (2012): Impact Assessment 1475: Designation of Marine Conservation Zones in English Inshore waters and English and Welsh Offshore waters. Defra.

Head National Nature Reserve.



Sources of information:
MMO marine planning portal
Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013; Annex I2. Site specific Impact Assessment Materials

2.1.1 Step 1.1: Define recreational uses and tourism activities

Trips to Torbay are made by both domestic and non-domestic visitors. Some of the most popular beaches include Babbacombe, Maidencombe and Oddicombe, while in Paignton, it is Broadsands, Goodrington Sands, Preston Sands and Paignton Beach that stand out and greatly contribute to Torbay's thriving tourism industry.

There are park and picnic areas in the vicinity[16].

Torbay has a strong history of water sports activity and was once the base for the prestigious 1948 Summer Olympics water sports; today the coastline continues to be used for both national and international events. There are four active sailing clubs (Torquay, Brixham, Paignton and Babbacombe) with over 50 maritime events per year.

Torbay is relatively sheltered and good for snorkelling[17]. Several diving clubs are active across Torbay, with many wreck sites for divers. Torbay is also a popular area for fishing.

16 http://www.torbay.gov.uk/index/yourbay/parks/parkareas/geoplaypark.htm

Marine life is abundant in Torbay and porpoises, dolphins and occasionally basking sharks are spotted. There are various companies offering boat trips to visitors. Torbay is the second most important area in the south west for wintering diver and grebe concentrations (SAD in Lieberknecht, et al. (2011), in Defra 2012).

Table 2-2 shows the activities for Torbay based on the MMO marine planning portal and information from the IA, as completed in the spreadsheet.

Table 2-2:	Level of activities at the site	
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Recreation categories	Activity	Current level of Use
Informal recreation	Walking/hiking	Very high
	Bathing, sunbathing, picnicking,	Very high
Wildlife observation	Wildlife watching - cetacean watching)	Very high
	Wildlife watching – bird watching	High
Water sports	General diving (scuba and snorkelling)	High
	Recreational angling	High
	Board sports (windsurfing, surfing and kite boarding)	High
	Paddle sports (kayaking, paddle boarding, canoeing, rowing)	High
	Sailing	High
	Motorboats (jet skis and motorboats)	Moderate
Other	Rock pooling	High

In addition, information on other important site characteristics is recorded as follows.

Table 2-3: Attributes affecting visitor numbers		
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Attribute	Score	Description
Facilities	High	There are facilities for the conduct of activities throughout the year (rent of snorkelling and windsurfing equipment). Torbay is promoted as a holiday destination, as a result there are visitors centres and caravanning sites (refer to Table 2.4)
Access to the site (travel opportunities)	High	There are specific trips organised around the conduct of specific activities and there are car parks and access to the sea is good
Awareness of the site	High	People will travel to visit the site because of specific activities and plan their holidays around these. Site is promoted at national/regional level.

17 http://www.englishriviera.co.uk/maritime/things-to-do/maritime-activities/snorkelling

Table 2-4 sets out the type of facilities supporting the different recreational activities.

Table 2-4: Baseline facilities		
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Facilities	**Number**	**Additional description on activity and source of info**
Angling and sport fishing centres	1	Shore-based fishing occurs all along the coastline. There is a particular concentration of shore-based and boat-based angling around the headlands of Hope's Nose and Berry Head. Species targeted include wrasse, bass, mackerel, garfish, bream, dab, dogfish, conger, codling and mullet.
Bird reserves and sanctuaries	?	Torbay is the second most important area in the south west for wintering diver and grebe concentrations.
Picnic areas		There are park and picnic areas in the vicinity. http://www.torbay.gov.uk/index/yourbay/parks/parkareas/geoplaypark.htm
Sightseeing and visitors centres	7	This site is well known for its visiting marine mega fauna (including basking sharks, bottlenose dolphins, common dolphins and porpoises).
Water sports training facilities (surfing schools, windsurfing schools, diving schools)	?	Several diving clubs are active across Torbay, offering beginner and advanced diving lessons. There are many wreck sites off Torbay for divers to experience. Surfing is a popular sport in Torbay. http://www.torbaysurfing.co.uk/about/ There are water sports centres which provide kayaking lessons and equipment. http://www.englishriviera.co.uk/things-to-do/productlist=/things-to-do/harbour-sports-p1278933&proxprodtype=attr
Caravanning sites	8 near the shore	There are caravans dotted all over and around 8 nearer the shore.
Blue Flag beaches	4	Torbay has many sandy beaches and is a popular tourist destination. http://www.torquay.com/torquay-beaches
RYA clubs	4	Racing occurs in the area. http://www.rtyc.org/
RYA marinas	1	
RYA training centres	6	Sailing and motor boat courses are available in Torbay. http://www.torbayseaschool.co.uk/

The different facilities are depicted in the following figure.

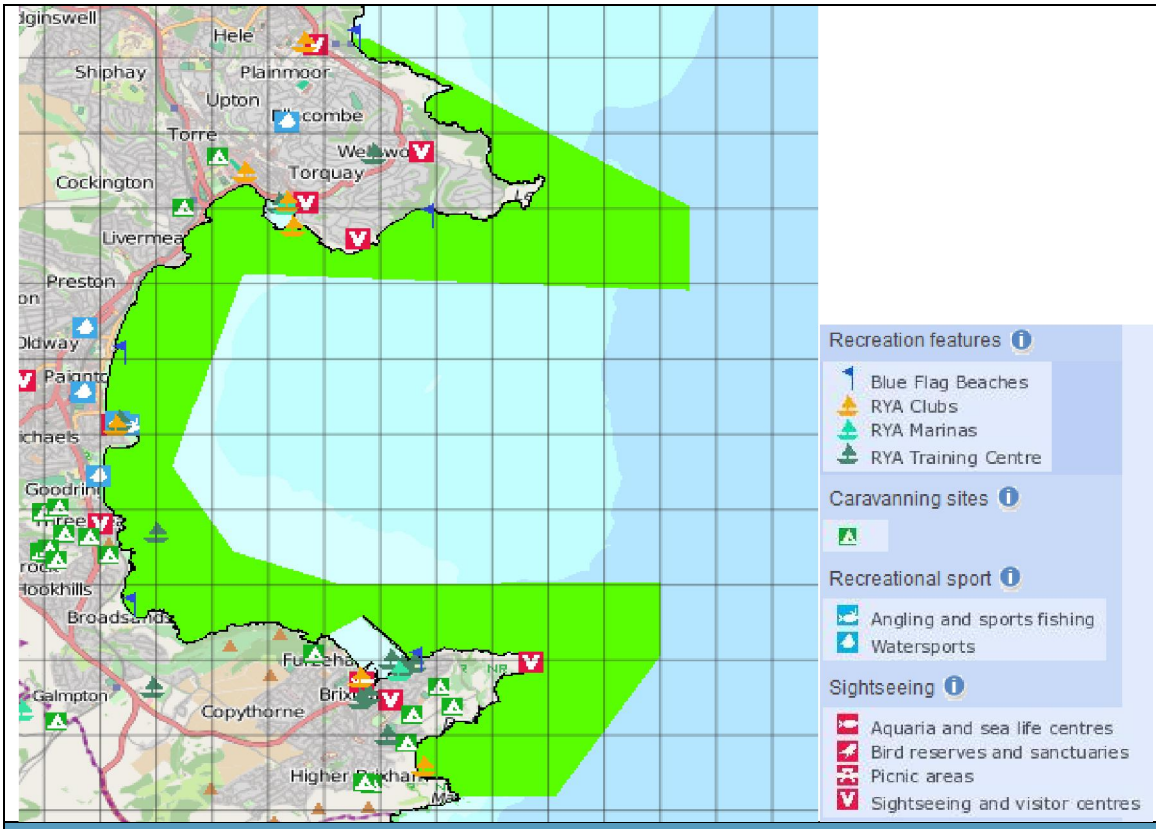


Figure 2-1: Facilities at Torbay for conducting recreational activities
Source: MMO marine planning portal

2.1.2 Step 1.2: Define conflicts among users

The following table shows the assessment of impacts from non-recreational uses on recreation and tourism. Overall, there are positive synergies between the different uses and there appears to be no conflict that may restrict the potential to realise the benefits.

Table 2-5: Non-recreational uses and interactions with recreational uses		
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Non-recreational uses	**Brief description**	**Impact on recreational uses**
Commercial fisheries	The rMCZ encompasses Brixham Harbour, one of the UK's principal fishing ports, as well as Paignton and Torquay harbours. It extends to approximately 1 nm from shore and is fished only by UK vessels. There is bottom trawling for sole, squid and cuttlefish, and mid-water trawling for sprat and anchovy in the bay, including in the rMCZ. Scalloping occurs seasonally (there are seasonal restrictions in place in the Devon and Severn IFCA district) and activity can be high, concentrated around the two headlands. Netters primarily targeting	Management of activities required for the cSAC may impose further restrictions on fishing activity in the area and therefore the area of the rMCZ. This may include limiting access to the cSAC for dredges and bottom trawls through the use of inshore Vessel Monitoring Systems (VMS). Recreational anglers may benefit

	pollack and bass work throughout the bay, including within the rMCZ, while hand liners target mackerel around the headlands. There is some potting in the rMCZ, principally targeting brown crabs, although whelks, lobster, cuttlefish and spider crabs and are also caught. The rMCZ is subject to a number of existing Devon and Severn IFCA fisheries restrictions, including a 'gentlemen's agreement' for fishers using dredges and bottom trawls not to fish in areas of sea grass. The rMCZ also overlaps with part of Lyme Bay and Torbay candidate Special Area of Conservation (SAC).	from increased availability of target species if commercial exploitation is reduced at the local level. If the condition of fish nursery and feeding habitats improve as a result of MCZ designation, the site may support increased numbers of fish through emigration and recruitment, although the site is small and there are few and sometimes contradictory data available on this effect.
Flood and coastal erosion risk management (coastal defence)	Much of the coastline of the rMCZ is protected from erosion although natural cliff edges remain. The approach favoured in the Shoreline Management Plan (SMP) along the coastline of the rMCZ is to 'hold the line' on the protected frontages and allow natural erosion to occur elsewhere. Besides on-going repair and maintenance routines for existing structures, in time more significant investment will be needed to maintain current standards of protection. Some disturbance may be unavoidable to offshore reefs as a result of longer-term schemes for near-shore structures. Mitigation may need to be provided for impacts on features protected by the Lyme Bay and Torbay cSAC. It is likely that this mitigation would be within the normal range of options typically required for large engineering projects of this nature.	The SMP highlights the value of the sandy beaches to the tourists of Torbay and indicates that these beaches may need to be artificially nourished in the medium and longer term.
Ports, harbours, shipping and disposal sites	As part of Brixham Harbour's long-term regeneration strategy, a new outer harbour breakwater, known as the Northern Arm Breakwater, is planned. The planned breakwater will not overlap with the rMCZ, but is within 500 metres of it. Funding is not currently available to take the development forward. Once funding can be put in place it is anticipated that the development will proceed (Torbay Development Agency, in Defra, 2012). The harbours of Paignton and Torquay are also within 5km of the rMCZ.	The purpose of the breakwater is to provide calmer wave conditions in the harbour to protect existing commercial and leisure activities, to facilitate the development of leisure uses (specifically the development of marina facilities) and to provide an enclosed safe harbour in all weather conditions.

As for recreational uses, there are no known conflicts.

2.1.3 Step 1.3: Summary of recreational and tourism value under baseline

Table 2-6 below shows the type of activities and level of recreational use under each.

Table 2-6: Summary of activities and level of use	
Site name	**Torbay**
Regional project	**Finding Sanctuary**
Level of use	**Recreational activity**
Moderate use	Motorboats (jet skis and motorboats);

High use	Wildlife watching; general diving (scuba and snorkelling); recreational angling; board sports (windsurfing, surfing and kite boarding); paddle sports (kayaking, paddle boarding, canoeing, rowing); sailing; rock pooling;
Very high use	Walking/hiking; general visits to the beach (strolling, sunbathing, picnicking, swimming, etc.)

The rMCZ boundary follows the boundary of the Torbay section of Lyme Bay, extending from the coastline to depths of approximately 30 metres. As a result, it has a larger tourism base than just marine activities. **Torbay is a type 1 site, i.e. a site actively used for tourism and recreation which generates revenue for the local economy.** Internet searches show that in 2009 (the most recent official Value for Tourism statistics), approximately 1.1 million staying visitors visited the resort plus 2.5 million day visitors, generating a total visitor spend of approximately £417 million. 23% of the population are now employed in the tourism sector, an increase of 2% since 2009, making tourism Torbay's main industry. The following table displays the trend for Torbay over the past five years. This includes visitors to Torbay council and key locations such as Babbacombe, Torquay, Cokington, Paignton and Brixham. The most recent survey for 2012 showed that largest proportions of visitors had or intended to visit Torquay seafront and/or Torquay harbour (72% in each case)[18]. The survey also showed that:

- 92% of visitors were on a leisure/holiday visits;
- 48% of visitors were staying overnight in Torquay at the time of their interview;
- Average length of stay was 5 nights;
- 85% of visitors were on a repeat visit to the resort; and
- 61% of visitors had travelled by car or van for the longest part of their journey to the English Riviera.

On the other hand, whereas the number of day visits has increased over time, the number of tourists, both domestic and overseas, has been declining.

Table 2-7:	English Riviera Tourism Statistics and Value					
	%trend over 5 years	2009	2008	2007	2006	2005
Day Visitors*						
Trips	6.7%	2,501,000	2,496,060	2,509,484	2,473,753	2,343,965
Sub-total day visitor value	13.8%	£110,579,000	£113,029,829	£108,332,954	£104,066,962	£97,183,245
Domestic Staying Visitors						
Trips	-22.1%	1,107,000	1,028,000	1,192,000	997,000	1,421,000
Nights	-28.6%	4,350,000	3,845,000	4,782,000	3,825,000	6,090,000

18 1,021 on street face-to-face interviews with visitors to the resort were carried out by a fully trained team of interviewers between June 2011 and May 2012. Information available at: http://www.englishrivieratourism.co.uk/english-riviera-visitor-survey.php

Table 2-7:	English Riviera Tourism Statistics and Value					
	%trend over 5 years	2009	2008	2007	2006	2005
Average duration	-8.6%	3.9	3.7	4	3.8	4.3
Sub-total domestic staying visitor value	-15.1%	£258,462,000	£236,634,000	£290,332,000	£198,846,000	£304,551,000
Overseas Staying Visitors						
Trips	-16.8%	87,600	101,100	104,200	102,600	105,300
Nights	-28.2%	591,600	788,100	585,300	714,600	824,300
Average duration	-13.4%	6.8	7.8	5.8	6.9	7.8
Sub-total overseas staying visitor value	-10.9%	£35,617,000	£40,594,000	£31,773,000	£33,144,000	£39,973,000
Additional spend	-7.4%	£11,947,000	£12,851,000	£14,722,000	£14,176,000	£12,905,000
Source: ENGLISH RIVIERA TOURISM COMPANY (ERTC): 2011/12 Business Plan, available at: http://englishrivieratourism.co.uk/documents/ERTC_2011-12_Business_Plan.pdf						

2.2 Stage 2: Screening the impacts from designation and management on recreation and tourism

2.2.1 Step 2.1: Impacts on recreation and tourism from changes in the environment

Task 1: Identifying changes in the environment

The first step will be to assess the impact on the environmental feature as a result of the designation. This will be provided by the conservation objective, although additional useful information for the impact assessment will be the time for recovery as well as spill over effects (for discounting purposes). Table 2-8 summarises the findings for Torbay, as given in the excel spreadsheet.

Table 2-8: Changes in conservation status					
Site name	**Torbay**				
Regional project	**Finding Sanctuary**				
Feature	**Area of Feature km2**	**No. Of Point Records**	**Condition without designation (baseline)**	**Conservation Objective**	**Additional notes, time for recovery, impacts off-site**
Broad-scale Habitats					
Subtidal mud	8.83	-	Unfavourable Condition	Recover to Favourable Condition	4 years to recovery[1]
Habitats of Conservation Importance					
Sea grass beds	0.90	3	Unfavourable Condition	Recover to Favourable Condition	Impacts off-site are not expected as the area of feature is only c.5% of total area. Recovery could be achieved fairly quickly, in 4 years[2]
Species of Conservation Importance					
Hippocampus guttulatus	-	1	Unfavourable Condition	Recover to Favourable Condition	This feature is currently not protected within existing MPAs within the Finding Sanctuary area. Impacts off-site are not expected but benefits may take a number of years to realise, i.e. 8 years (based on a two year generation time and recovery of the sea grass habitat)[3]

1 Mud habitats are typically slow to recover as they occur in areas of low physical perturbation (i.e., where the seabed is not subjected to strong tidal currents or large waves). Shallow mud habitats had not recovered 213 days after experimental disturbance in North Wales (Dernie, et. al. 2003), while Kaiser, et. al. (2006) estimated that, on average, biota recovery (as a proxy for habitat recovery) in muddy-sand habitats was estimated to occur after 1,210 days, although this was thought likely to be an over-estimate. 4 years is provided as an estimate for recovery in Torbay, given the relatively shallow nature of the site and its vulnerability to wave disturbance.

2 Reise and Kohlus (2008) reported a fourfold increase in Zostera spp. bed area in the Waddensea in 12 years, and that sediment stability (i.e., when natural and anthropogenic disturbance is low) was the key factor determining Sea grass dynamics. In the absence of anthropogenic disturbance, Rasheed (1999) estimated a 1 year recovery time for a fast growing tropical Zostera spp. subject to clearing within experimental plots. Overall, in the absence of further direct anthropogenic disturbance, 4 years is provided as an estimate for recovery of this habitat type in the Torbay area.

3: From: http://www.iucnredlist.org/details/full/41006/0): *H. guttulatus* matures at an early age, has rapid growth rates, and a short generation time, traits which suggest that it may recover rapidly when direct (e.g., exploitation) and indirect (e.g., by-catch and habitat damage) effects of disturbance cease, but may be vulnerable to extended periods of poor recruitment (Curtis and Vincent 2006). In addition, *H. guttulatus* adults have low dispersal and limited migration (Caldwell and Vincent 2012). This reduces their ability to colonize new areas, recolonize old ones, and in addition reduces their ability to move when habitat becomes unfavourable.

8 years is provided as an estimate of recovery for *H. guttulatus*, based on a two-year generation time and in absence of direct anthropogenic disturbance. However, the low dispersal of this species and the limited availability of additional suitable habitat nearby mean that recovery may extend over a longer period if the population within

the Torbay area is severely depleted.

Sources:

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

Caldwell, I.R. and Vincent, A.C.J. (2012). Revisiting two sympatric European seahorse species: apparent decline in the absence of exploitation. Aquatic Conservation: Marine and Freshwater Ecosystems Online Early View.

Curtis, J.M.R. and Vincent, A.C.J. (2006). Life history of an unusual marine fish: survival, growth and movement patterns of Hippocampus guttulatus Cuvier 1829. Journal of Fish Biology 68: 707-733.

Dernie, K.M., Kaiser, M.J. and Warwick, R.M. (2003). Recovery rates of benthic communities following physical disturbance. Journal of Animal Ecology 72: 1043–1056

Kaiser, M.J., Clarke, K.R., Hinz H., Austen, M.C.V., Somerfield, P.J., and Karakassis, I. (2006). Global analysis of response and recovery of benthic biota to fishing. Marine Ecology Progress Series, 311: 1–14

Rasheed, M.A. (1999). Recovery of experimentally created gaps within a tropical Zostera capricorni (Aschers.) sea grass meadow, Queensland Australia. Journal of Experimental Marine Biology and Ecology, 235: 183-200

Reise, K. and Kohlus, J. (2008). Sea grass recovery in the Northern Wadden Sea? Helgoland Marine Research, 62:77-84.

Task 2: Identification of recreational uses under baseline benefiting from changes in environmental quality

Table 2-9 describes the links between the features and specific recreational uses, as given in Table 2-8 (above). As designation is expected to protect habitats and features supporting species with recreational values, positive impacts might be expected for a number of users.

Table 2-9: Recreational uses benefiting from improvement in feature conservation status				
Site name	**Torbay**			
Regional project	**Finding Sanctuary**			
Feature/habitat	**Conservation objective**	**Supported species with recreational value**	**Other (Time for recovery and impacts off-site MCZs)**	**Recreational use under baseline**
Sea grass beds	Recover	Animal communities on the seabed. Nursery area, young fish and shellfish, Seahorses, *Hippocampus guttulatus*	As given in Table 2-8	Snorkelling Recreational diving Bird watching Cetacean watching Recreational fisheries (i.e. Recreational Sea Angling (RSA) and Recreational potting)
Long snouted seahorse *Hippocampus guttulatus*	Recover	-	As given in Table 2-8	Snorkelling Recreational diving

2.2.2 Step 2.2: Impacts from management on recreational activities and tourism

Task 1: Impacts from management strategies on recreational uses

Some information on management strategies has been gathered from the draft IA by Defra. The information is summarised in Table 2-10. The main impacts on recreational uses is through the conservation gains.

Table 2-10: Impact of other management strategies on recreation and tourism		
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Management strategy	**Provide further details**	**Describe impacts on specific habitats and recreational uses**
Closure of parts of the MCZs (area of sea grass) or even the whole of the MCZ to bottom trawls, traps, nets, hooks and lines	These are the different management scenarios provided under the IA for commercial fisheries which ranges from zoned closure of sea grass bed to closure of the entire MCZ	The closure of parts of the MCZs (area of sea grass) or even the whole of the MCZ to bottom trawls, traps, nets, hooks and lines is likely to affect some recreational users positively due to improvements in conservation status. This will include divers, snorkelers and recreational sea anglers. There could also be benefits to wildlife watchers.

Task 2: Management of recreational activities

Speed limits to passage of boats around Berry Head will still apply and anchoring will be permitted subject to the existing code of conduct. Thus marginal impacts on recreational activities due to additional restrictions are unlikely to be significant.

2.2.3 Step 2.3: Impact on recreation from improvements in services to visitors

It appears unlikely that the number of facilities and access will improve as the site is currently well provisioned. If there were any improvements, these would not be expected to be significant.

2.2.4 Step 2.4: Impact on recreation from promotion

There may be opportunities for further promotion due to designation. It could be expected that the MCZ label could be used to promote a destination of excellence and to attract more visits by the Torbay Development Agency (TDA). These are more likely to be linked to informal recreation activities (as the degree of awareness of the site among formal recreational users is already significant). However, there could be promotion of specific activities related to wildlife watching and additional information about the feature being recovered could benefit existing users. The site is currently being promoted as the English Riviera and is also known for its Geopark designation. Thus, recreational benefits could accrue to existing users following additional promotion but these are not expected to be significant.

2.2.5 Step 2.5: Impact on tourism

Activities conducted in Torbay support the local economy. Because the TDA is actively involved in promoting the site it is expected that designation will be used as a tool for promoting the site[19]. However, capacities to increase demand are limited to off-peak periods (as the site is already popular and may be suffering from overcrowding in high season).

Torbay is not considered to have many alternative sites offering similar recreational opportunities across the different recreational uses. The Exe estuary offers a similar range of activities but it is not as popular. It needs to be noted however that Skerries Bank and Surrounds (which is within average travelling distances according to the averages given for the south west) have similar types of recreational users but in smaller numbers (there are not as many facilities). Skerries Bank and Surrounds is also proposed as an rMCZ for the first tranche as a result displacement not expected to be significant.

2.2.6 Step 2.6: Summary of screening

Table 2-11 presents the result of the screening exercise for Torbay.

[19] It should be noted that any potential costs of promotion to local Development Agencies or Local Councils are not included in the MCZ Impact Assessment. It is assumed that any promotion decisions will be taken on a local basis, where appropriate.

Table 2-11: Results of impact screening				
Name of site	**Torbay**			
Regional project	**Finding Sanctuary**			
Designation leading to…	**Impact likely?**	**Recreational category affected**	**Tourism impacts?**	**Justification**
Conservation gains likely? (NB: habitats --> species with recreational value)	Yes	Divers Anglers Wildlife watchers	Yes	The closure of parts of the MCZs (area of sea grass) or even the whole of the MCZ to bottom trawls, traps, nets, hooks and lines is likely to affect some recreational uses positively due to improvements in conservation status. There are users under these categories carried in charter boats (according to StakMap) so tourism impacts are also likely.
Improvement in relevant facilities likely? (NB: describe the type of facilities that may be improved or provided)	No	No	n/a	The site has a considerable amount of facilities, and access is regarded as good. Thus, this aspect is expected to remain unchanged and no tourism impacts may stem from this aspect alone.
Promotion likely	Yes	Most users	Yes	The Tourism Development Agency (TDA) has stated its wish to support activity which attracts traditional markets. This continues to be the backbone of the resort's customer base and tourism spend. However, the TDA will embrace all opportunities to increase visitors and visitors' spend. The TDA will particularly concentrate on attracting sustainable and more affluent visitors at off peak and shoulder periods, targeting specific market segments with dedicated packages and promotions. Growth in new markets will be specifically targeted at business outside of the July and August peak. MCZ designation could complement the TDA efforts to promote the site but impacts are not expected to be significant.
Other (e.g. through management activities and/or reduction in conflict?)	Yes	Divers Anglers	Yes	The closure of parts of the MCZs (area of sea grass) or even the whole of the MCZ to bottom trawls, traps, nets, hooks and lines is likely to affect some recreational uses positively through a reduced level of use for the conduct of their recreational pursuit. This will include divers, snorkelers and recreational sea anglers.

2.3 Stage 3: Impact evaluation from designation and management on recreation

2.3.1 Step 3.1: Assessing the impacts on existing users

Step 3.1.1: Qualitative assessment of impacts

Table 2-12 presents the results of the analysis for Torbay in qualitative terms. It shows that the impacts on bird watching and cetacean watching are not expected to be significant; so these impacts may not warrant quantification. On the other hand, the impacts on snorkelling, recreational diving, and angling may be moderate.

Table 2-12: Qualitative assessment of impacts on existing users			
Site name	**Torbay**		
Regional project	**Finding Sanctuary**		
Existing recreational activity	**Level of impacts on quality of the experience**	**Reasoning**	**Confidence assessment**
Walking/hiking	Small	For general informal recreational users the benefits may be limited as access and facilities are not expected to improve. There could be a perception that the site is better (linked to promotion of the site as an MCZ) but these impacts are not expected to be significant as visitors may be attracted for alternative designations such as the Geopark and/or blue flags.	Low
General visits to the beach (strolling, sunbathing, picnicking, swimming, etc.)	Small		
Wildlife watching	Moderate	The impacts will be linked to the conservation benefits although promotion of the site may help with the perception of the site resulting in a better quality of the experience.	Low
General diving	Moderate	There could be moderate benefits to divers as a result of the conservation gains to habitats supporting specific species with recreational value (seahorse).	Moderate
Recreational angling	Moderate	There could be moderate benefits to recreational anglers as a result of the conservation gains to habitats supporting specific species with recreational value. Benefits for anglers primarily depend on the reduction in mortality following management measures that affect the commercial fishery. If overall mortality on fishes in the MCZ is reduced, there are likely to be some increases in biomass of fishes in the MCZ (pers. comm. 2013[20]).	Low
Board sports (windsurfing, surfing and kite boarding)	Small	As for informal recreation, these users may derive benefits from knowing that the site has been designated but it is unlikely that these are	Low

20 Simon Jennings (Cefas)

Table 2-12: Qualitative assessment of impacts on existing users			
Paddle sports (kayaking, paddle boarding, canoeing, rowing)		significant.	
Sailing			
Motorboats (jet skis and motorboats)			

Because the scale and confidence in the assessment for informal recreational users and water sports, other than diving, is recorded to be low, these recreational categories have not been carried forward in the assessment. The following steps focus on the impacts on divers, anglers and wildlife watchers where the impacts are expected to be moderate.

Step 3.1.2: Estimating the additional number of visits by existing users

The following table sets out the number of users for the different recreational categories under the baseline. This information is based on StakMap data; as a result the level of confidence is recorded to be moderate and it is expected that the number of users may be underestimated (hence sensitivity testing on visitors' number is undertaken under Stage 5).

Table 2-13: Estimating number of users affected				
Site name	**Torbay**			
Regional project	**Finding Sanctuary**			
Existing recreational activity	**Level of impacts**	**Number of current users**	**Source of data**	**Level of confidence**
Recreational angling	Moderate	777	StakMap	Moderate. The numbers may be bigger as StakMap does not record anglers on charter boats (but internet searches show otherwise).
General diving (scuba and snorkelling)	Moderate	45	StakMap	Moderate. The numbers may be bigger as StakMap does not record divers on charter boats (but internet searches show otherwise).
Wildlife watching	Moderate	1146	StakMap	Moderate. These are recorded as Wildlife Enthusiasts Carried on Boats.

Table 2-14 summarises the assumptions as to the current level of use and the increment in the frequency of visits due to conservation gains and promotion. Estimates of the average number of trips are based on a recent survey conducted on divers and anglers for the National Ecosystem Assessment (NEA)[21]. The confidence in the assessment is low due to the assumptions that apply.

[21] Provided to consultants as part of study consultation.

Table 2-14: Assessing additional visits per year							
Site name	**Torbay**						
Regional project	**Finding Sanctuary**						
Existing recreational activity	**Number of visitors**	**Average number of trips per year under baseline**	**Additional number of trips per user**		**Additional number of trips per year (increase in average x number of users affected from changes)**		**Confidence assessment**
			Lower	**Upper**	**Lower**	**Upper**	
Recreational sea anglers	777	12.25	0.6	1.2	476	951	Low - Assumes an increase of 5-10% based on the level of impacts, estimated as moderate. The number of visitors is estimated to be low, but the frequency of visitation is expected to be accurate as it is based on a survey (NEA, 2013). Consultation on the number of users did not provide additional information in time for validation.
General diving (scuba and snorkelling)	45	5.04	0.3	0.5	11	23	Low- Assumes an increase of 5-10% based on the level of impacts, estimated as moderate. The number of visitors is estimated to be low but the frequency of visitation is expected to be accurate as it is based on a survey (ibid).
Wildlife watchers	1146	2.99	0.1	0.3	171	343	Low – Assumes an increase in the number of visits from 5% to 10%. The frequency of visitation is based on an average for diving among a number of rMCZs (based on survey, ibid).

Step 3.1.3: Monetary valuation of benefits to existing users

Task 1: Travel costs based approach

Existing users will incur a travel cost for additional visits conducted to the site, this is used as a proxy for how much users are willing to pay to visit the site. This revealed preference-based approach circumvents some of the problems of approaches based on stated preferences, such as response bias, as values are inferred by actual behaviour. In addition, it is less costly than the creation of hypothetical markets through surveys. Existing travel costs are reported in the MENE survey.

The following table sets out the travel costs from a pivot table derived for Torbay local authority from the MENE survey on travel costs (NB: as there were no estimates for divers, it has been assumed to be the same as for wildlife watching). Because there are no alternative sites for Torbay offering a similar quality of experience, these values are expected to represent best proxies of the total benefits arising to existing users. However, as reflected by the confidence assessment they should be read with caution due to the following:

- the travel costs reported by MENE are based on a limited sample[22];
- changes in participation rates are also assumed as a % increase based on the qualitative assessment of impacts.

It is likely that the figures in Table 2-15 underestimate the total recreational benefits (as the estimates on the number of users are deemed to be small).

Table 2-15: Assessing recreational benefits to existing users (rounded to the nearest thousand)

Site name	**Torbay**			
Regional project	**Finding Sanctuary**			
Recreational activity	**Average travel and parking spend (£per trip)**	**Additional benefits to recreational users- revealed preference approach**		**Confidence assessment**
		Lower bound	**Upper bound**	
Fishing	80	£38,000	£76,000	Low: travel costs are based on a very limited sample. A number of assumptions apply to the increment in annual trips.
Divers	50	£1,000	£1,000	
Wildlife watching	50	£9,000	£17,000	

Task 2: Extended approach (applying consumer surplus for specific recreational categories)

In addition, there may be benefits to anglers in terms of consumer surplus from the additional trips conducted, i.e. if anglers gain benefit over and above what they are willing to pay to travel there (as described in the methodology). In order to exercise caution the value of £87.11 is applied to the

[22] MENE asks respondents about their trip expenditure including petrol and car parking (q.15) and about party composition, additional adults on the visit (q.13).

additional number of trip (as the site has coastal access). Because this value relates to a travel cost of £17 based on the average of the upper and lower bound and the travel expenditure for Torbay is greater, the consumer surplus is estimated at £23.60[23] for day trippers (but this is likely to underestimate the recreational benefits for those people spending more than a day angling). The recreational benefits from the additional number of trips (rounded to the nearest thousand) are estimated to range from:

- Low estimate (476 additional trips)= £11,000
- High estimate (951 additional trips)= £22,000

When changes in conservation status are expected to impact the diversity of species and the size of catch, additional values could apply to account for the change in conservation value. The value taken here is £1.10 per trip applied across **all trips** (based on a moderate improvement, increase of 5% in fish size). The benefits are thus estimated as approximately £11,000 to £12,000 per year.

Task 3: Adjustment for displacement

This report aims to estimate *additional* benefit, rather than visitors simply displacing their visit from other similar sites. The amount of displacement has been estimated by considering alternative sites nearby. Existing users will probably continue to use the case study site against alternatives such as the Exe estuary. Although some displacement may be possible (e.g. should the case study site suffer from overcrowding at peak periods), this impact is highly uncertain. As a result, displacement impacts are expected to be negligible.

2.3.2 Step 3.2: Estimating the impacts to new users

Due to the fact that the site is already popular among the public at regional and national level it appears unlikely that there will be a significant increase in the number of new users to the site following designation. Moreover, as the site is more popular among tourists, new users are more likely to be displaced from alternative tourist destinations.

2.3.3 Step 3.3: Summary of impacts

The total benefits to Torbay are estimated to range between £69k and £128k per year. However a number of caveats can be highlighted. These are presented in the summary of assumptions and reflected in the level of confidence.

[23] This is calculated as 87.11+16.49-80

Table 2-16:	Summary recreational benefits per year			
Site name	Torbay			
Regional project	Finding Sanctuary			
Recreational category	Recreational benefits (£)		Confidence	Summary of assumptions
	Lower	Upper		
Recreational sea anglers	£38,000	£76,000	Low	This is based on additional travel expenditure.
	£11,000	£22,000	Low	Consumer surplus per additional trip conducted.
	£11,000	£12,000	Low	Consumer surplus for gains in conservation value for all trips.
Diving/snorkelling	£1,000	£1,000	Low	This is based on additional travel expenditure but apply the same travel costs as for wildlife watchers. It will underestimate the benefits, but there are currently no estimates of consumer surplus for divers/snorkelers.
Wildlife watchers	£9,000	£17,000	Low	This is based on additional travel expenditure.
Total	**£69,000**	**£128,000**	**Low**	Total benefits are likely to be underestimated (based on low estimates of number of users).

2.4 Stage 4: Impacts evaluation from designation and management on tourism

2.4.1 Step 4.1: Qualitative assessment of impacts

There are known charter boats operating at the site for angling and wildlife watching that may benefit from designation. Table 2-17 summarises the qualitative evaluation of impacts for the tourism sector.

Table 2-17: Qualitative assessment of tourism impacts			
Site name	Torbay		
Regional project	Finding Sanctuary		
Business affected/recreational uses	Level of impacts due to new visits	Confidence assessment	Justification
Charter boats (for wildlife watchers, anglers and divers)	Moderate	Moderate	StakMap does not show records of divers carried on charter boats but it does for anglers and wildlife watchers. These will generate revenue but the increases in visitation are not expected to be significant. On the other hand, StakMap does not record divers and anglers on charter boats.
Catering sector	Moderate	Moderate	Impacts from the additional visits across all users.

2.4.2 Step 4.2: Quantitative assessment of impacts

It is know that there are charter boats operating in Torbay. Fletcher, et. al. (2012) reports the turnover of diving business but the total number of businesses operating at the site is not known. Also there is one known angling fishing centre.

Table 2-18: Torbay business revenues

Ecosystem Service	Activity	Value	Valuation confidence
Nature watching	Berry Head also see values for charter boat operators	No data available from Torbay Coast and Countryside Trust for visitor numbers to Berry Head	
Sport/ Recreation	Charter boat	£7,580 yr^{-1} turnover (Rees, et. al. 2010)	Underestimate
	Diving	£274,210 yr^{-1} expenditure from club divers (Rees, et. al. 2010)	Underestimate
	Dive business	£351,936 yr^{-1} turnover (Rees, et. al. 2010)	High valuation confidence
	Angling	£945,354 yr^{-1} expenditure (Rees, et. al. 2010)	Underestimate
Fletcher et al (2012): Securing the benefits of the Marine Conservation Zone Network, A report to The Wildlife Trusts, available at: http://www.bbowt.org.uk/sites/default/files/files/Securing_The_Benefits.pdf			

2.4.3 Step 4.3: Monetary assessment of impacts

Table 2-19 presents the summary of impacts for the tourism sector annual benefits. This is based on the average spend as reported by MENE for Torbay Local Authority. These values are applied to the additional number of trips in order to estimate the total annual benefits to the tourism sector. As noted earlier, the latest statistics on visitor spend note approximately £417 million. The designation of Torbay as an MCZ could increase spend by around 0.2% based only on the existing users increasing the number of visits per year following designation.

These estimates are likely to underestimate the benefits from new users coming to the site. There are no known alternatives to Torbay offering similar recreational opportunities. However, if these were to come from the nearest alternative, which is Skerries Bank, it will just represent a transfer in terms of tourism benefits. When comparing the estimates with the figures reported by Fletcher on turnover, in particular the upper estimate for the dive business, the figure of £2,000 appears to be low, representing a 0.5% increase in turnover for the average diving business (which offers services to divers including gear and training); on the other hand, shall this expenditure fall on the charter boat (or skippers taking the divers to suitable sites) the tourism benefits could amount to a significant increase in their turnover.

Table 2-19: Tourism benefits				
Site name	**Torbay**			
Regional project	**Finding Sanctuary**			
Recreational category	**Average of spend on other items (£)**	**Additional revenue to the tourism industry (£)**		**Confidence assessment**
		Low estimate	**High estimate**	
Recreational angling	16	£8,000	£15,000	Low - Assumes an increase of 5-10% based on the level of impacts, estimated as moderate.
Diving	85	£1,000	£2,000	Low- Assumes an increase of 5-10% based on the level of impacts, estimated as moderate. Expenditure as from wildlife watching (may overestimate expenditure).
Wildlife watching	85	£15,000	£29,000	Low – Assumes an increase in the number of visits from 5% to 10%.
Total		**£23,000**	**£46,000**	Low- Underestimate of total benefits (as there may be new users coming to the site). Figures may not add up due to rounding.

2.5 Stage 5: Discounting and sensitivity analysis

2.5.1 Discounting

Table 2-20 presents the summary of recreational and tourism benefits for Torbay in annual terms, i.e. undiscounted.

Table 2-20: Tourism and Recreational benefits – UNDISCOUNTED benefits				
Site name	**Torbay**			
Regional project	**Finding Sanctuary**			
Recreational activity	**Tourism benefits and benefits to recreational users (based on travel costs only)**		**Tourism benefits and benefits to recreational users (extended approach[24])**	
	Low	**Upper**	**Low**	**Upper**
Recreational angling	£46,000	£91,000	£68,000	£125,000
General diving (scuba and snorkelling)	£2,000	£3,000	£2,000	£3,000
Wildlife watching	£23,000	£46,000	£23,000	£46,000
Total	**£70,000**	**£141,000**	**£93,000**	**£175,000**

[24] This includes the travel costs plus consumer surplus related values from additional use and conservation aspects.

However, in order to present the benefits over a 20 time year frame, discounting is needed. The following assumptions apply to the timing of benefits for discounting purposes based on Table 2.8 (NB: designation and management assumed to be happening in year 0):

- Benefits to divers will arise in year 4, based on the recovery of sea grass bed and there may be some noticeable impacts on the population of sea horses but with maximum benefits being achievable in year 10;
- Benefits to anglers and wildlife watchers are not expected to be noticeable until year 8 and reach maximum benefits at year 15 from designation and implementation of management measures.

The discounted benefits are given in Table 2-21.

Table 2-21: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	**Lower**	£555,000
	Upper	£1,048,000

2.5.2 Sensitivity testing

Sensitivity analysis is undertaken in order to test the robustness of the monetary assessment to the assumptions made. The main sources of uncertainty concern the number of participants as well as the validity of benefit transfer values for consumer surplus. The following tests are suggested:

Changes in number of participants

Throughout the assessment we have highlighted the uncertainty surrounding the number of users at Torbay. Based on consultation undertaken for this study, it is believed that the average numbers used from StakMap may underestimate the number of users. As a result, the first sensitivity analysis has used the maximum value of the grids for number of users, as reported in StakMap data. This implies the following changes:

- Number of recreational anglers is reported to be 1,915 anglers per year;
- Number of divers is recorded to be 142.

Assuming the same frequencies of visitation and all the other assumptions being the same, the recreational and tourism benefits will now range from £1.2m to £2.2m, which is about double the

amount under the main assessment. This is due to a significant increase in the number of users. This sensitivity testing highlights the importance of validating baseline numbers concerning the number of users. On the other hand, it may be unlikely that all these visitors may increase their frequency of visitation.

Table 2-22: Sensitivity test 1: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	**Lower**	£1,177,000
	Upper	£2,201,000

Exclusion of consumer surplus

Table 2-23 sets out the recreational benefits when consumer surplus, based on utility gains, are excluded for the monetary assessment. The exclusion of consumer surplus will reduce the recreational benefits by a maximum of 31%. This reflects the high sensitivity of the benefits to the inclusion of this type of values.

Table 2-23: Sensitivity test 2: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Torbay**	
Regional project	**Finding Sanctuary**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users (revealed preference approach only)	**Low**	£423,000
	Upper	£847,000

3 Stour and Orwell

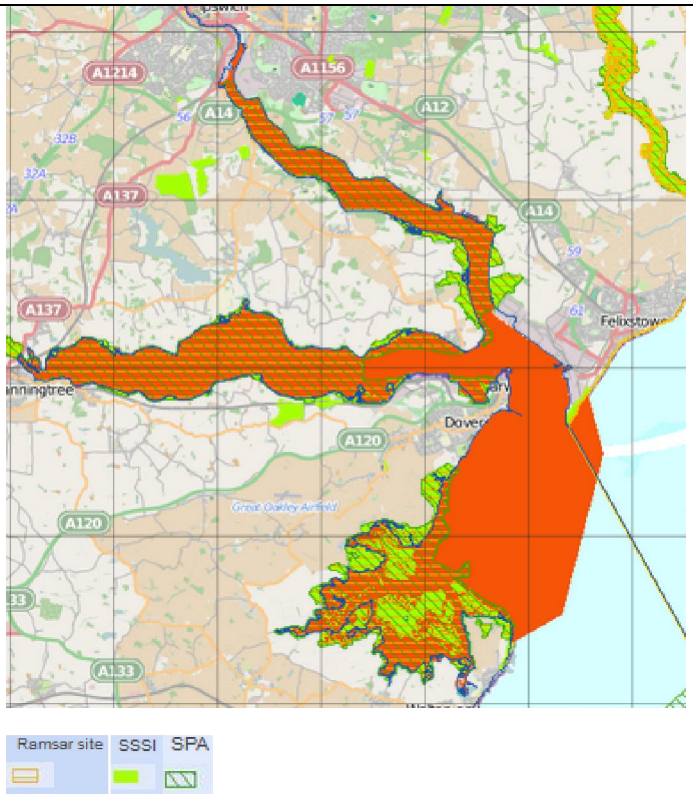
3.1 Stage 1: Baseline definition

The Stour and Orwell estuaries straddle the eastern part of the Essex/Suffolk border in eastern England. The estuaries include extensive mud-flats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The site also includes an area of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell. In summer, the site supports an important number of breeding Avocets (Recurvirostra avosetta), while in winter they hold major concentrations of water birds, especially geese, ducks and waders. The geese also feed, and waders roost, in surrounding areas of agricultural land outside the SPA.

The site has close ecological links with the Hamford Water and Mid-Essex Coast SPAs, lying to the south on the same coast.

Table 3-1 provides basic information on the Stour and Orwell rMCZ proposed in the consultation IA.

Table 3-1: Basic information about rMCZ	
Site name	**Stour and Orwell**
Regional project	**Balanced Seas Regional Project**
Site Area	87 km^2
Depth range (m)	<=10 m
Type of site	Inshore: Estuarine
Overlaps with existing MPA (SPAs, SACs, SSSIs, RAMSAR sites)	**International Designations** Site significantly overlaps inshore SPA The site covers the Stour and Orwell Ramsar site **National Designations** SSSI

Map of the r MCZ	
Source: MMO marine planning portal	

3.1.1 Step 1.1: Define recreational uses and tourism activities

The Stour and Orwell Estuaries are a popular destination for recreational boaters. The shelf area is used throughout the season for dinghy racing. The Harwich Area Sailing Association has a large membership and the clubs organise regattas and a series of races that attract visitors. Both estuaries are important nursery areas for fish caught recreationally.

Bird watching is also very popular, as is coastal walking. The banks of the Orwell and the north side of the Stour lie within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty.

Table 3-2 shows the activities for Stour and Orwell based on the MMO marine planning portal and information from the IA, as completed in the spreadsheet.

Table 3-2:	**Level of activities at the site**	
Site name	**Stour and Orwell**	
Regional project	**Balanced Seas**	
Recreation categories	**Activity**	**Current level of Use**
Informal recreation	Walking/hiking	Very high
	General visits to the beach (strolling, sunbathing, picnicking, swimming, etc.)	Low use

Table 3-2:	Level of activities at the site	
Wildlife observation	Bird watching	High use
Water sports	Diving (scuba and snorkelling)	Low use
	Recreational angling	High use
	Angling from Charter Boats	Moderate use
	Board sports (windsurfing, surfing and kite boarding)	Moderate use
	Paddle sports (kayaking, paddle boarding, canoeing, rowing)	Moderate use
	Sailing	High use
	Motorboats (jet skis and motorboats)	Moderate use
Other	Rock pooling	Low use
	Harvesting from the foreshore (bait collecting and intertidal gathering)	Moderate use
	Wildfowling	Moderate use

In addition, information on other important site characteristics is recorded in Table 3-3.

Table 3-3: Attributes affecting visitor numbers		
Site name	**Stour and Orwell**	
Regional project	**Balanced Seas**	
Attribute	**Score**	**Description**
Facilities at the site /adjacent to the site supporting recreational activities	Medium/High - There are shops and facilities for the conduct of specific activities but they do not operate throughout the year and only on peak season.	There are multiple walks and cycle routes as well as some picnic spots. According to the MMO planning portal there are 15 RYA clubs; 7 RYA marinas; 10 RYA training centres. There are 7 sailing clubs representing over 3,000 members, and 6 marinas maintaining over 1,600 berths and 110 swinging moorings. Suffolk Coast and Heath have created a map of the area showing car parks, bus stops and stations, ferries etc. (see http://www.suffolkcoastandheaths.org/assets/Projects--Partnerships/Stour--Orwell/Maps/Stour-Orwell-maprecreation.eps.pdf).
Access to the site	Medium - There are public transport connections and people travel by private transport (car park facilities are available). The site is accessible by shore and boat	There are good transport links (both public and private) to the main urbanised areas such as Ipswich, and to the ports of Felixstowe and Harwich. However, the local transport network for the Shotley peninsula (between the Stour and the Orwell) is limited. No rail station and restricted bus services. There is a foot and cycle ferry service in the summer months linking Shotley Marina, Harwich and Felixstowe. http://southsuffolklibdems.org.uk/en/article/2010/0

Table 3-3: Attributes affecting visitor numbers		
		84570/lib-dem-councillors-warn-of-flooding-threat-to-essential-county-roads http://www.harwichharbourferry.com/
Awareness of the site	Medium - The site attracts visitors from the region and not just local visitors. The site is promoted at regional level.	The Stour and Orwell area is already well known as a destination for its high quality of natural and built environment around the estuaries. This makes it attractive to visitors, and large numbers visit the estuaries for quiet recreation, especially walking, sailing and cycling.

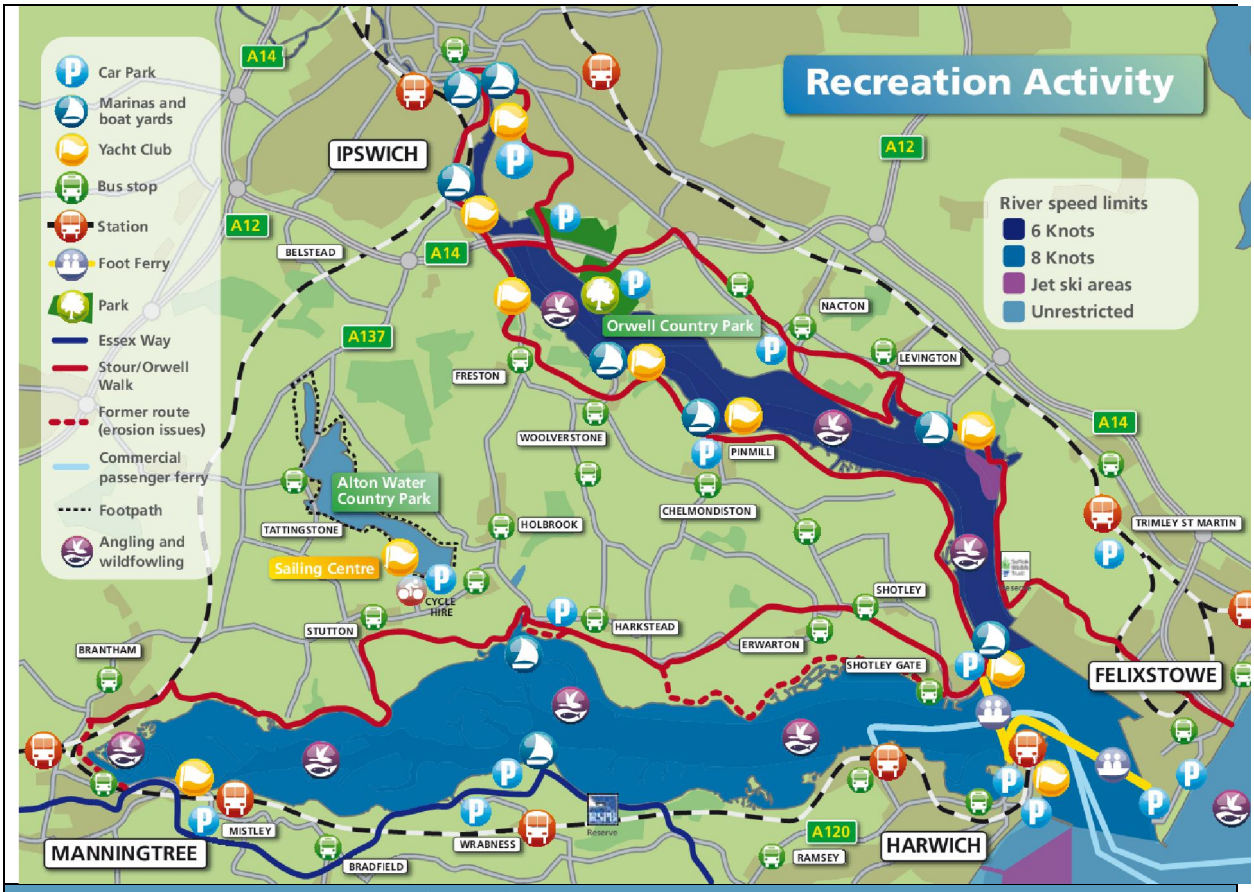


Figure 3-1: Recreation map Stour and Orwell
Source: http://www.suffolkcoastandheaths.org/assets/Projects--Partnerships/Stour--Orwell/Maps/Stour-Orwell-maprecreation.eps.pdf

3.1.2 Step 1.2: Define conflicts among users

Table 3-4 shows the assessment of impacts from non-recreational uses on recreation and tourism.

Table 3-4: Non-recreational uses and interactions with recreational uses		
Site name	**Stour and Orwell**	
Regional project	**Balanced Seas**	
Non-recreational uses	**Brief description**	**Impact on recreational uses?**
Commercial fisheries	The rMCZ is wholly within 6nm and is fished only by UK vessels. Most of the boats within this commercial fleet are small (under 10 m) day trip fishers which operate out of Felixstowe Ferry, Shotley, Walton and Harwich. A variety of static and mobile gears are used within the area, allowing flexible and versatile fishing effort. Vessels trawl for sole during the summer and autumn, with plaice and ray forming an additional catch. This switches to cod and whiting until the end of the year, when several boats opt to use nets and lines rather than trawls. The majority of smaller boats join the lobster and crab potting fishery at the beginning of summer. There is a seasonal whelk fishery, and seasonal set and drift net fisheries for sole, bass and cod. Winter herring and sprat are targeted by trawl or drift nets if quota is available. Long lines are set for cod, ray and bass. Kent and Essex IFCA and Eastern IFCA byelaws have closed the estuaries to oyster dredging for about 2 years. Estimated annual value of landings from the rMCZ: £0.045m/yr.	Competition from recreational fishers may deplete stocks and reduce catch for recreational fishers, reducing their benefit. Closure of the estuaries to oyster dredging may have a positive impact on the ecosystem which may in turn increase benefits for recreational fishers and other tourists.
Flood and coastal erosion risk management (coastal defence)	This activity is not expected to be negatively affected by the rMCZ (existing activities at their current levels and future proposals known to the regional MCZ projects).	No impacts expected.
Ports, harbours, shipping and disposal sites	There are 6 ports and harbours within 5 km of the rMCZ which may undergo development at some point in the future. Major ports in the area include the port of Felixstowe which handles over 40% of all UK containerised traffic. It is the largest container port in Britain and is the only port in the UK that can handle the new large container ships. There are 23 disposal sites within 1 km of the rMCZ which are licensed for disposal of channel dredge material and are likely to be used by the ports of Felixstowe, Harwich and Ipswich. The average number of licence applications received for all of these disposal sites is 3.4 per year. There are also several dredged channels within 1 km of the rMCZ associated with the Harwich Haven ports.	Although ports and harbours provide a means of embarkation and access to the water which can benefit recreation users and tourists, large scale commercial ports such as Harwich and Felixstowe may have the opposite effect.
Research and education	Suffolk and Essex Wildlife Trusts conduct research within the rMCZ and are part of the Stour and Orwell Estuary Management Group (SOEMG), a multi-sectorial group with a number of research programmes under way oriented to improving the management of the estuaries, and exploring opportunities to improve visitor experience. Harwich	Research which is aimed at improving the management of the estuaries, and exploring opportunities to improve visitor experience should have a positive effect on recreation

Table 3-4: Non-recreational uses and interactions with recreational uses		
	Haven and the Eastern Inshore Fisheries and Conservation Authority (EIFCA) both conduct regular research as part of their statutory duties. Guided walks and educational activities are organised in the Orwell Country Park adjacent to the rMCZ by Ipswich Borough Council. The SOEMG is working with young people to increase understanding of the estuaries. Essex and Suffolk Wildlife Trusts both have small reserves along the banks of the estuary which are open to visitors (Essex and Suffolk Wildlife Trusts' websites).	and tourism.

3.1.3 Step 1.3: Summary of recreational and tourism value under baseline

Table 3-5 below shows the type of activities and level of recreational use under each.

Table 3-5: Summary of activities and level of use	
Site name	**Stour and Orwell**
Regional project	**Balanced Seas**
Level of use	**Activities**
Low use	General visits to the beach (strolling, sunbathing, picnicking, swimming, etc.); diving (scuba and snorkelling); rock pooling Paddle sports (kayaking, paddle boarding, canoeing, rowing);
Moderate use	Angling from charter boats; board sports (windsurfing, surfing and kite boarding); motorboats (jet skis and motorboats); harvesting from the foreshore (bait collecting and intertidal gathering); wildfowling;
High use	Recreational angling; sailing; bird watching;
Very high use	Walking/hiking;

The Stour and Orwell is used for recreation but is only popular and well known for a few recreational activities. Bird watching and boating are the main activities. Tourism is of moderate relevance at the site but there are recreational benefits to users. As a result, the Stour and Orwell is a type 2 site, actively used for tourism and recreation but not considered to be a honeypot.

3.2 Stage 2: Screening the impacts from designation and management on recreation and tourism

3.2.1 Step 2.1: Impacts on recreation and tourism from changes in the environment

Task 1: Identifying changes in the environment

The rMCZ at Stour and Orwell would protect a large proportion of the low energy intertidal rock found in the Balanced Seas Project Area and a very high diversity of habitats and species compared with other UK estuaries (with over 250 taxa recorded). This richness is thought to be a result of the

stable saline conditions in the estuaries. The rMCZ contains several examples of estuarine rocky habitats including an example of Harwich Stone Band (Cementstone/London Ashfall Clay Band) habitat, which is known only from the Stour, Orwell and Deben estuaries and which supports interesting algal communities. The rMCZ also has wild and un-harvested native oyster beds, extensive blue mussel beds, sheltered muddy gravels, peat and clay exposures, populations of the tentacled lagoon worm and starlet sea anemone, and subtidal sands and gravels. It is one of only two sites in the Balanced Seas project area where honeycomb worm reef and Ross worm reef have been recorded together. The area is considered an important fish nursery throughout the year for several species, and the almost permanent presence of juvenile bass here is considered to be unprecedented among British estuaries[25].

Table 3-6 summarises the findings for Stour and Orwell, as given in the excel spreadsheet.

[25] Source: Balanced Seas Final Recommendations (2011).

Table 3-6: Changes in conservation status						
Site name	**Stour and Orwell**					
Regional Project (if applicable)	**Balanced Seas**					
Features for designation	**Current conservation status**	**Area of feature (km^2)**	**Area of feature as a % of total area**	**No. of point records**	**Conservation objective**	**Additional notes, time for recovery, impacts off-site**
Habitats of Conservation importance						
Honeycomb worm *Sabellaria alveolata* reef	Unfavourable condition	0.02	0.02%	n/a	Recover to favourable condition	18 months -3 years[26]
Oyster beds	Unfavourable condition	0.59	0.68%	n/a	Recover to favourable condition	2-4 years depending on conditions [27]
Ross worm *Sabellaria spinulosa* reef	Unfavourable condition	0.45	0.52%	n/a	Recover to favourable condition	1 year[28]
Sheltered muddy gravels	Unfavourable condition	n/a	n/a	28 records	Recover to favourable condition	No data found

26 Dyer (nd): Sabellaria and its implications for developments, Thomson Unicomarine

27 Cranfield et al (2010): Promising signs of regeneration of blue cod and oyster habitat changed by dredging in Foveaux Strait, Southern New Zealand, New Zealand Journal of Marine and Freshwater Research, 35:5, 897-908; also Marlin website: http://www.marlin.ac.uk/speciesbenchmarks.php?speciesID=3997

28 Marlin website: http://www.marlin.ac.uk/speciesbenchmarks.php?speciesID=4278]

Task 2: Identification of recreational uses under baseline benefiting from changes in environmental quality

Table 3-7 describes the links between the features and specific recreational uses, as given in the Table 3-6 (above). As designation is expected to protect habitats and feature supporting species with recreational values, positive impacts might be expected.

Table 3-7: : Recreational uses benefiting from improvement in feature conservation status			
Site name	**Stour and Orwell**		
Regional project	**Balanced Seas**		
Feature/habitat	**Conservation objective**	**Supported species with recreational value**	**Recreational use under baseline**
Honeycomb worm *Sabellaria alveolata* reef	Recover to favourable condition	-	No direct recreational uses were identified.
Oyster beds	Recover to favourable condition	-	Angling.
Ross worm *Sabellaria spinulosa* reef	Recover to favourable condition	-	No direct recreational uses were identified.
Sheltered muddy gravels	Recover to favourable condition	King Rag worm *Alitta (Neanthes) virens*	Angling. Bait digging for the King Rag worm *Alitta (Neanthes) virens* occurs where this species is common (especially in slightly reduced salinity conditions) (UK Biodiversity Partnership 2010).

3.2.2 Step 2.2: Impacts from management on recreational activities and tourism

Task 1: Impacts from management strategies on recreational uses

Some information on management strategies has been gathered from the draft IA by Defra. The information is summarised in the following table but the impacts on recreation will be felt through the benefits on conservation (as reflected by the conservation objective). Other spatial conflicts are not reported so further benefits from this aspect are not considered further.

Table 3-8: Impact of other management strategies on recreation and tourism		
Site name	**Stour and Orwell**	
Regional project	**Balanced Seas**	
Management strategy	**Provide further details**	**Describe impacts on specific habitats and recreational uses**
Zoned closure for bottom trawls and dredges, or entire closure the MCZs to bottom trawls, traps, nets, hooks and lines (to protect areas of Ross worm *Sabellaria spinulosa* reef)	These are the different management scenarios provided under the IA for commercial fisheries which ranges from zoned closure to closure of the entire MCZ	Protection of areas of Ross worm *Sabellaria spinulosa* reef. May increase benefits to recreational anglers but although recovery can be quite rapid, there is a much longer time frame before they reach the dimensions historical account suggest they may have reached. These are the ones believed to encourage fish.
Kent and Essex IFCA and Eastern IFCA byelaws have closed the estuaries to oyster dredging for about 2 years.	IFCA management	Protection of oyster beds.
Creation of no-anchoring zones for recreational vessels (except in emergency circumstances) over sensitive features (Ross worm *Sabellaria spinulosa* and honeycomb worm *Sabellaria alveolata*).		Protection of areas of Ross worm *Sabellaria spinulosa* and honeycomb worm *Sabellaria alveolata*). As there is little or no anchoring over the current known extent of *Sabellaria*, this is not expected to impact recreational boat anchoring significantly.
Defra (2012): Annex I2. Site specific Impact Assessment materials (Option 2) [Box 2 in Stour and Orwell section]		

Task 2: Management of recreational activities

The draft impact assessment notes that there will be creation of no-anchoring zones for recreational vessels (except in emergency circumstances) over sensitive features (Ross worm and honeycomb worm). The area of the feature is considered very small (0.52% of the total area). As a result, impacts are expected to be negligible. Other restrictions are not expected.

3.2.3 Step 2.3: Impact on recreation from improvements in services to visitors

The popularity of the site for various reasons and activities indicates that increased services and facilities may be possible. Designation would 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.

The RSPB manages a bird watching reserve along the Stour Estuary and this activity is very popular in the area. Designation may lead to an increase in wildlife watching visits to the site.

The banks of the Orwell and the north side of the Stour lie within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty. The estuaries and their surroundings attract visitors from nearby Colchester, Ipswich and Felixstowe and much further afield. Marinas and jetties are found along the banks, providing access to and from the tidal waters for recreational and tourist activities.

Coastal walking is popular within the rMCZ with 42 miles of promoted long distance paths including the Stour and Orwell Path and the Essex Way (Long Distance Walkers Association website and Stour & Orwell Estuaries Management Strategy, 2010).

As a result, benefits could accrue for existing recreational uses depending on the type of access and facilities improved.

3.2.4 Step 2.4: Impact on recreation from promotion

Promotion can have an impact on existing users but also bring new users. In the case of the Stour and Orwell, designation could help improve investment in knowledge provision or promotion of the site by means of the following:

- activity-based (e.g., interpretation boards, self-guide leaflets to encourage better experience (but also knowledge of opportunity); and
- location-based (e.g., production of leaflets, guides to attract people to area, specific pages/sections on web-sites – by local tourist board, local authority, wildlife trust, etc.)

3.2.5 Step 2.5: Impact on tourism

Tourism at the site creates revenue. Activities which are likely to support business in this area include: RYA clubs, RYA training centres, caravanning, anglers on charter boats, walking (pubs, shops, etc.), canoeing, etc.

There are other alternative sites close by to the Stour and Orwell. The site has close ecological links with the Hamford Water and Mid-Essex Coast SPAs, lying to the south on the same coast, and the Wallasea Inland, as RSPB site, and South Essex Marshes to the south for sightseeing. Although the Wallasea Inland may be too far away as an alternative for birdwatching, there are a number of RSPB sites in the nearby area (e.g. Boyton and Hollesley Marshes, Havergate Island Cattawade Marshes, Flatford Wildlife Garden, Snape, Wolves Wood, North Warren, Minsmere, Dingle Marshes and Old Hall Marshes). The number of alternatives for birdwatching appears to be moderate to high and some displacement is likely.

Of the 31 sites put forward for designation in 2013 the Blackwater, Roach and Colne Estuaries (approximately 26 miles from Ipswich to Brightlingsea) is nearby. According to StakMap both sites offer similar activities but there seem to be more anglers on charter boats at the Blackwater, Roach and Colne Estuaries. Therefore the number of alternative sites is considered to be moderate. Some displacement may thus be possible (this will represent a transfer in some of the additional expenditure from one location to another).

3.2.6 Step 2.6: Summary of screening

Table 3-9 presents the result of the screening exercise for Stour and Orwell.

Table 3-9: Results of impact screening				
Name of site	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Designation leading to…	**Impact likely?**	**Recreational category affected**	**Tourism impacts?**	**Justification**
Conservation gains likely? (NB: habitats --> species with recreational value)	Yes	Anglers (bait digging)	Yes	Angling (may also benefit from additional management measures, including restrictions on anchoring) Bait digging for the King Rag worm *Alitta (Neanthes) virens* occurs where this species is common (especially in slightly reduced salinity conditions) (UK Biodiversity Partnership 2010).
Improvement in relevant facilities likely? (NB: describe the type of facilities that may be improved or provided)	Yes	Informal recreation	n/a	The site has some facilities but these may be improved following designation
Promotion likely	Yes	Most users	Yes	Designation would 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. The RSPB manages a bird watching reserve along the Stour Estuary and the activity is very popular in the area. Designation may lead to an increase in wildlife watching visits to the site
Other (e.g. through management activities and/or reduction in conflict?)	Yes	Anglers	Yes	Restrictions on anchoring may improve the quality of the features more quickly and a result benefit existing users but this aspect is captured by the conservation objective.

3.3 Stage 3: Impact evaluation from designation and management on recreation

3.3.1 Step 3.1: Assessing the impacts on existing users

Step 3.1.1: Qualitative assessment of impacts

Table 3-10 presents the results of the analysis for Stour and Orwell in qualitative terms. As it can be seen the main benefits may arise to informal recreational users, bird watchers and anglers as these

may perceive the area to be better, particularly bird watchers. The other groups may enjoy the conservation gains. Promotion may make the site more attractive.

Table 3-10: Qualitative assessment of impacts on existing users			
Site name	**Stour and Orwell**		
Regional project	**Balanced Seas**		
Existing recreational activity	**Level of impacts on quality of the experience**	**Reasoning**	**Confidence assessment**
Walking/hiking	Moderate	These could be linked to increased promotion and facilities and the perception that the site is protected increasing the quality of the experience	Low
General visits to the beach (strolling, sunbathing, picnicking, swimming, etc.)	Small	The site is more popular for walkers, it is unlikely that these activities will develop further due to the character of the coast.	Moderate
Bird watching	Moderate	The impacts will be linked to the conservation benefits although promotion of the site may help with the perception of the site resulting in a better quality of the experience.	Low
Diving (scuba and snorkelling)	Small	The site is not particularly popular for divers.	Moderate
Recreational angling	Moderate	They may benefit from the protection of nursery areas.	
Board sports (windsurfing, surfing and kite boarding)	Small	The level of these activities is not significant so unlikely to benefit.	Moderate
Paddle sports (kayaking, paddle boarding, canoeing, rowing)	Small		
Sailing	Small	The area has 7 sailing clubs and 6 marinas so marginal benefits from additional promotion are unlikely.	Moderate

Step 3.1.2: Estimating the additional number of visits by existing users

The following table sets out the number of users for the different recreational categories under the baseline.

Table 3-11: Estimating number of users affected				
Site name	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Existing recreational activity	**Level of impacts**	**Number of current users**	**Source of data**	**Level of confidence**
Walking/hiking	Moderate	99,390 - VISITS	MENE – Number of visits	Moderate. The MENE data has visitor estimates for the year 2011/2012 for the following coordinates which may be given as a proxy of visitors to the entirety of the site; X: 624608 Y: 233635 X: 612730 Y: 242847
Bird watching	Moderate	13,000 visits	Pers. Comm. (2013)	Moderate. Based on pers. Comm[29].
Recreational angling	Moderate	826	StakMap	Moderate. These are recorded mainly for charter boats and it is the sum of anglers on charter boats and other anglers.

Table 3-12 summarises the assumptions as to the current level of use and the increment in the frequency of visits. The confidence in the assessment is low due to the assumptions that apply.

Table 3-12: : Assessing additional visits per year							
Site name		**Stour and Orwell**					
Regional project		**Balanced Seas**					
Existing recreational activity	**Current Level of usage**	**Average number of trips per year under baseline**	**Additional number of trips per user**		**Additional number of trips per year (increase in average x number of users affected from changes)**		**Confidence assessment**
			Lower	**Upper**	**Lower**	**Upper**	
Informal recreation	99,390 visits	n/a	n/a	n/a	4,970	9,939	Low/moderate - Assumes an increase of 5-10% based on the level of impacts, estimated as high.
Bird watching	13,000	n/a	n/a	n/a	650	1,300	Low/moderate- Assumes an increase of 5-10% based on the level of impacts, estimated as high.
Recreational angling	826	9.60	0.5	1	396	793	Low/moderate – Assumes an increase in the

[29] Communication with Tom Hooper, RSPB (2013).

							number of visits from 5% to 10% but frequencies of visitation based on divers' survey (pers. comm, 2013).

Step 3.1.3: Monetary valuation of benefits to existing users

Task 1: Travel costs based approach

Existing users will incur a travel cost for additional visits conducted to the site. Estimates for Ipswich from the MENE survey on travel costs are not available. As a result, the regional averages have been used.

Table 3-13: Assessing recreational benefits to existing users (rounded to the nearest thousand)				
Site name	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Recreational activity	**Average travel and parking spend (£per trip)**	**Additional benefits to recreational users- revealed preference approach**		**Confidence assessment**
		Lower	**Upper**	
Informal recreation	£11 (average East of England)	£55,000	£109,000	Low/moderate - travel costs based on regional averages. A number of assumptions apply to the increment in annual trips.
Bird watching	£18 (average East of England)	£12,000	£23,000	
Recreational angling	£5 (average East of England)	£2,000	£4,000	

Task 2: Extended approach (applying Consumer Surplus for specific recreational categories)

In addition, there will be benefits to anglers and informal recreational users in terms of consumer surplus from the additional trips conducted. The values of £13.83 and £98.6030 are applied to the additional number of trips (as the site has coastal access). The benefits (rounded to the nearest thousand) are estimated and given in Table 3-14.

[30] This is calculated as 87.11+16.49-5

Table 3-14: Assessing recreational benefits to existing users (rounded to the nearest thousand)				
Site name	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Recreational activity	**Value**	**Benefits to recreational users- consumer surplus**		**Confidence assessment**
		Lower	**Upper**	
Informal recreation	£13.83	£69,000	£137,000	Low - The value is the mid-range between smaller sites with many alternatives and sites offering more significant recreational opportunities (as given in the methodology).
Recreational angling	£98.60	£39,000	£78,000	Low - The value is the average for a site with both boat based and shore based angling.

Additional values could apply to account for the change in conservation value. The value taken here is £1.10 per trip applied across **all trips** (based on a moderate improvement, greater size of catch of approximately 5% in weight). The benefits are thus estimated as follows:

- Low estimate = £9,000
- High estimate= £10,000

Task 3: Adjustment for displaced visits

Because Blackwater, Crouch, Roach and Colne Estuaries appear to be the main alternative for fishers, it may be likely that they may be transferring visits from this. Displacement is more likely when the alternatives offer a lower quality of the experience. On the other hand, since Blackwater is also an rMCZ likely to be nominated in 2013, the displacement effect may not be significant. As for informal recreation, displacement is expected to be very low because of the same reason. As a result, the estimates can be considered a good proxy of the benefits to existing users.

On the other hand, due to the number of RSPB sites nearby, there could be some displacement of bird watching activities. It is estimated that 30% of the new visits could be displaced[31]. The new benefits are set out in Table 3-15.

[31] This is based on a low to medium level of displacement, as Stour and Orwell may still be the preferred site for existing birdwatchers.

Table 3-15: Assessing recreational benefits to existing users (rounded to the nearest thousand)				
Site name	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Recreational activity	**Average travel and parking spend (£per trip)**	**Additional benefits to recreational users- revealed preference approach**		**Confidence assessment**
		Lower	**Upper**	
Informal recreation	£11 (average East of England)	£55,000	£109,000	Low/moderate - travel costs based on regional averages A number of assumptions apply to the increment in annual trips
Bird watching	£18 (average East of England)	£8,000	£16,000	
Recreational angling	£5 (average East of England)	£2,000	£4,000	

3.3.2 Step 3.2: Estimating the impacts to new users

Step 3.2.1: Qualitative assessment of impacts

It is likely that promotion and designation may attract new users. Impacts are categorised as moderate for the informal recreational category. The impacts in terms of increased visits from new anglers are expected to be small (as they may also prefer to go to the Colne estuary which appears to be a better quality fishery).

Step 3.2.2: Estimating the number of new users (i.e. non-repeat visitors)

Figures of visitors from the Colne estuary from the MENE survey indicate a number of 165,950 visits. It is unlikely that the Stour and Orwell will attract the same number of visits, a this will reflect a 66% increase which is too significant. A more reasonable increment of 10% will entail an increase of c.10,000 visits per year approximately. These are not expected to be displaced from alternative sites. On the other hand, additional visits by existing users were estimated to range from 4,969 to 9,939. Thus, in order not to overestimate the number of visits by new visitors, these could be taken off the total estimated number of visits. The maximum increment in the number of visits is 5,000 additional visits per year (rounded to the nearest thousand). Because this figure is uncertain however, it has been tested for sensitivity.

Step 3.2.3: Monetary evaluation of benefits to new users

Task 1: Travel costs based approach

The upper bound benefits applying the same travel costs as above can be estimated at approximately £55,000.

Table 3-16: Economic benefits to new users				
Site name	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Recreational category	**Additional number of trip from new users**	**Travel expenditure**	**Travel expenditure X additional trips**	**Summary of assumptions/notes**
Informal recreation	5,000	£11 per trip	55,000	Assumes a 10% increase in the number of visits, not displaced.

Task 2: Extended approach (applying consumer surplus to the additional number of visits)

The value of £13.83 is also applied to the number of additional visits for the new recreational users. The benefits are estimated at around £69,000 per year.

Task 3: Adjustment for displaced visits

No displacement is expected for informal recreational users as most of these are assumed to be day visits by local visitors. However, this assumption is tested against in the sensitivity analysis below.

3.3.3 Step 3.3: Summary of impacts

The total estimated benefits at Stour and Orwell are estimated to range between £182k and c£0.48 million per year.

Table 3-17:	Summary recreational benefits per year			
Site name	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Recreational category-existing users	**Recreational benefits (£)**		**Confidence**	**Summary of assumptions**
	Low	**High**		
Informal recreation	£55,000	£109,000	Moderate	Travel costs-existing users.
	£69,000	£137,000	Moderate	Consumer surplus-existing users.
	-	£55,000	Low	New users-travel costs.
	-	£69,000	Low	New users-consumer surplus.
Bird watching	£8,000	£16,000	Low	Based on travel costs and considers displacement from nearby alternative RSPB sites of up to 30%.
Recreational angling	£2,000	£4,000	Moderate	Based on travel costs.
	£39,000	£78,000	Moderate	Consumer surplus for additional angling trips.
	£9,000	£10,000	Low	Consumer surplus from conservation gains.
TOTAL	**£182,000**	**£478,000**	**Low**	Estimates on travel costs appear to be of the right order of magnitude, and assumptions apply to incremental number of trips.

3.4 Stage 4: Impacts evaluation from designation and management on tourism

3.4.1 Step 4.1: Qualitative assessment of impacts

The following table depicts the qualitative evaluation of impacts for the tourism sector.

Table 3-18: Qualitative assessment of tourism impacts			
Site name	**Stour and Orwell**		
Regional project	**Balanced Seas**		
Business affected/recreational uses	**Level of impacts due to new visits**	**Confidence assessment**	**Justification**
Charter boats (for anglers and divers)	Moderate	Moderate	StakMap records anglers carried on charter boats. These will generate revenue but the increases in visitation are expected to be moderate.
Catering sector	Moderate	Moderate	Impacts from the additional visits across all users.

3.4.2 Step 4.2: Quantitative assessment of impacts

There are known to be charter boats at Stour and Orwell for angling (according to StakMap) but there is no information as to the number of charter boats operating.

3.4.3 Step 4.3: Monetary assessment of impacts

Table 3-19 presents the summary of impacts for the tourism sector. This is based on the average spend as reported by MENE for East Anglia. These values are applied to the additional number of trips (both existing and new users') in order to estimate the total annual benefits to the tourism sector. These estimates are likely to underestimate the benefits. The main reason is that the average spend for East Anglia, based on MENE, appears to be low.

Table 3-19: Tourism benefits				
Site name	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Recreational category	**Average of Spend on other items (£)**	**Additional revenue to the tourism industry**		
		Lower estimate	**Upper estimate**	**Confidence assessment**
Informal recreation	2	£10,000	£30,000	Low – the average spend appears to be low but estimates include new users
Bird watching	2	£1,000	£2,000	Low- the average spend appears to be low. The impacts on the number of trips may also be underestimated but displacement of 30% is considered.
Recreational angling	4	£2,000	£3,000	Low/moderate- average spend appears to be low
Total		**£12,000**	**£35,000**	Low- average spend appears to be low

3.5 Stage 5: Discounting and sensitivity analysis

3.5.1 Discounting

The following table depicts the value of the recreational and tourism benefits undiscounted. Most of the benefits for the Stour and Orwell are related to recreational benefits as opposed to tourism benefits (this is because the site is popular among informal recreational users and the expenditure reported for the group affected is normally low, as it may involve local and day users).

Table 3-20: Tourism and Recreational benefits – UNDISCOUNTED benefits				
Site name	**Stour and Orwell**			
Regional project	**Balanced Seas**			
Recreational activity	**Tourism benefits and benefits to recreational users (travel costs only)**		**Tourism benefits and benefits to recreational users (extended approach)**	
	Low	**Upper**	**Low**	**Upper**
Walking/hiking	£65,000	£194,000	£133,000	£400,000
Bird watching	£9,000	£18,000	£9,000	£18,000
Recreational angling	£4,000	£7,000	£52,000	£95,000
Total	**£77,000**	**£219,000**	**£194,000**	**£513,000**

Discounting is undertaken based on the following assumptions:

1- Informal recreational benefits are assumed to start in year 3 following promotion and improvements of facilities and maximum benefits are expected to arise in year 6;
2- Benefits to birdwatchers and recreational angling benefits are expected to arise in year 8, following habitat improvements and reaching a maximum in year 15.

The discounted benefits are given in Table 3-21.

Table 3-21: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Stour and Orwell**	
Regional project	**Balanced Seas**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	**Low**	£1,885,000
	Upper	£5,240,000

3.5.2 Sensitivity testing

Due to the moderate level of confidence on the number of users, it is not suggested to test for the baseline estimates of number of participants. On the other hand, there is greater uncertainty surrounding the increased number of new visitors. Because of this, the first sensitivity testing concerns the exclusion of visits by new users.

Reduced number of new visits

Excluding the impact of new visitors to the Stour and Orwell, will reduce the recreational and tourism benefits to the site by around 40%. The following Table presents the result of this sensitivity test. Due to the significance of this test, it is suggested that changes in the number of visitors, i.e. non-repeat visitors, is monitored in future assessments as well as whether new visitors are displaced from alternative locations.

Table 3-22: Sensitivity test 1: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Stour and Orwell**	
Regional project	**Balanced Seas**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	**Low**	£1,885,000
	Upper	£3,718,000

Exclusion of consumer surplus

Exclusion of consumer surplus will also have a significant impact on the level of recreational impacts. This is because the consumer surplus to anglers and informal recreational users will add significantly to the recreational benefits from designation.

Table 3-23: Sensitivity test 2: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Stour and Orwell**	
Regional project	**Balanced Seas**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users (revealed preference approach only)	**Low**	£813,000
	Upper	£2,364,000

4 Tamar Estuary

4.1 Stage 1: Baseline definition

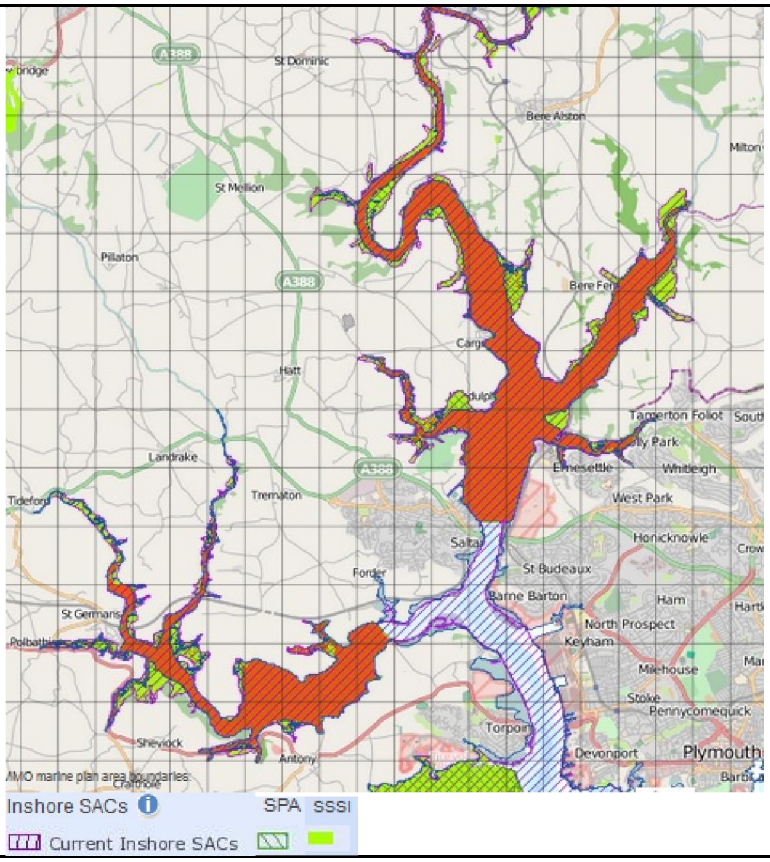
The Tamar Estuary is a coastal plain estuary located to the west of Plymouth. The Tamar extends from North Cornwall flowing for approximately 100 km towards the south, while amassing water discharge from its two major tributaries, the river Tavy and the river Lynher. It has a catchment area of approximately 1,700 km^2. The estuary is tidal for about 31 km from the Weir head to the mouth of Plymouth Sound where it discharges into the ocean.

This rMCZ site consists of two spatially separate component areas. The upper Tamar and Tavy estuary forms one part and stretches along the OS Boundary Line mean high water mark from Gunnislake to just north of the Tamar Bridge at Saltash. The second part consists of the Lynher estuary with its smaller tributaries; this spans the mean high water mark from the tidal limits at Tideford and north of Landrake to Jupiter point near the mouth of the Lynher.

The Tamar Estuary is very important for species of seahorses. The Seahorse Trust has records of a number of live and dead specimens from this region, many of which have been provided by the Marine Biological Association in Plymouth (Defra, 2012).

Table 4-1 sets out some background information for the Tamar Estuary rMCZ.

Table 4-1:	**Basic information about rMCZ**	
Site name	**Tamar Estuary**	
Regional project	**Finding Sanctuary**	
Area	**15km^2**	
Type of site	**Estuarine**	
Overlaps with existing MPA (SPAs, SACs, SSSIs, RAMSAR sites)	**International designations**	
	SAC, SPA	The site is located within the Plymouth Sound and Estuaries SAC The site is located within the Tamar Estuaries complex SPA
	National designations	
	SSSI, AONB	The Tamar-Tavy portion of the rMCZ lies within the Tamar-Tavy Estuary SSSI. The Lynher portion of the rMCZ lies within the Lynher Estuary SSSI.



Sources of information:
Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013; Annex A1 – Part 1. – Balanced Seas – Sites proposed for designation in 2013

Marine Management Organisation, Marine Planning Portal, accessed at:
http://planningportal.marinemanagement.org.uk/#

4.1.1 Step 1.1: Define recreational uses and tourism activities

The Tamar Estuary attracts large numbers of tourists and visiting recreational users and there are numerous trails and walks around the estuary[32].

The Tamar Estuary and adjoining land accommodate a wide range of recreational activities such as walking and cycling, wildlife watching, sailing, angling, wildfowling, canoeing, jet skiing, water skiing, windsurfing, stand up paddle boarding and swimming. Access and recreation underpin significant and increasing economic activity for marine commerce and tourism (Tamar Management Plan 2013-18[33]).

The following table shows the activities for Tamar Estuary based on the MMO marine planning portal and information from the IA, as completed in the spreadsheet.

[32] http://www.tamarvalley.org.uk
[33] http://www.plymouth.gov.uk/tecf_temp20132018.pdf

Table 4-2: Level of activities at the site		
Site Name	**Tamar Estuary**	
Regional Project	**Finding Sanctuary**	
Recreation categories	**Activity**	**Current level of Use**
Informal recreation	Walking/hiking	Very high use
	General visits to the beach (strolling, sunbathing, picnicking, swimming, etc.)	High use
Wildlife observation	Wildlife watching (bird watching)	Very high use
Water sports	Diving (scuba and snorkelling)	Low use
	Recreational angling	High use
	Board sports (windsurfing, surfing and kite boarding)	High use
	Paddle sports (kayaking, paddle boarding, canoeing, rowing)	Very high use
	Sailing	Very high use
	Motorboats (jet skis and motorboats)	High use
Other	Wildfowling	Low use

In addition, information on other important site characteristics which affect visitor numbers to the Tamar Estuary are recorded in the table below. The justification for this is given in Figure 4.1.

Table 4-3: Attributes affecting visitor numbers		
Site name	**Tamar Estuary**	
Regional project	**Finding Sanctuary**	
Attribute	**Score**	**Description**
Facilities at the site /adjacent to the site supporting recreational activities	Medium	The MMO marine planning portal indicates some availability of caravanning sites. There appears to be a significant number of RYA clubs and training centres. There is only one visitor centre.
Access to the site	Medium/High	There is road access to the site and numerous walking routes around the site. There is train access to Plymouth, and via the Tamar Valley branch line, to four stations along the Tamar Valley Discovery Trail. There is bus access to both ends and to many intermediate points. The branch line railway runs parallel to the southern part of the Trail.
Awareness of the site	Medium/High	The site attracts visitors from the region and not just local visitors. The site is promoted at regional level but it is also a Ramsar site and thus may attract visitors from outside the region.

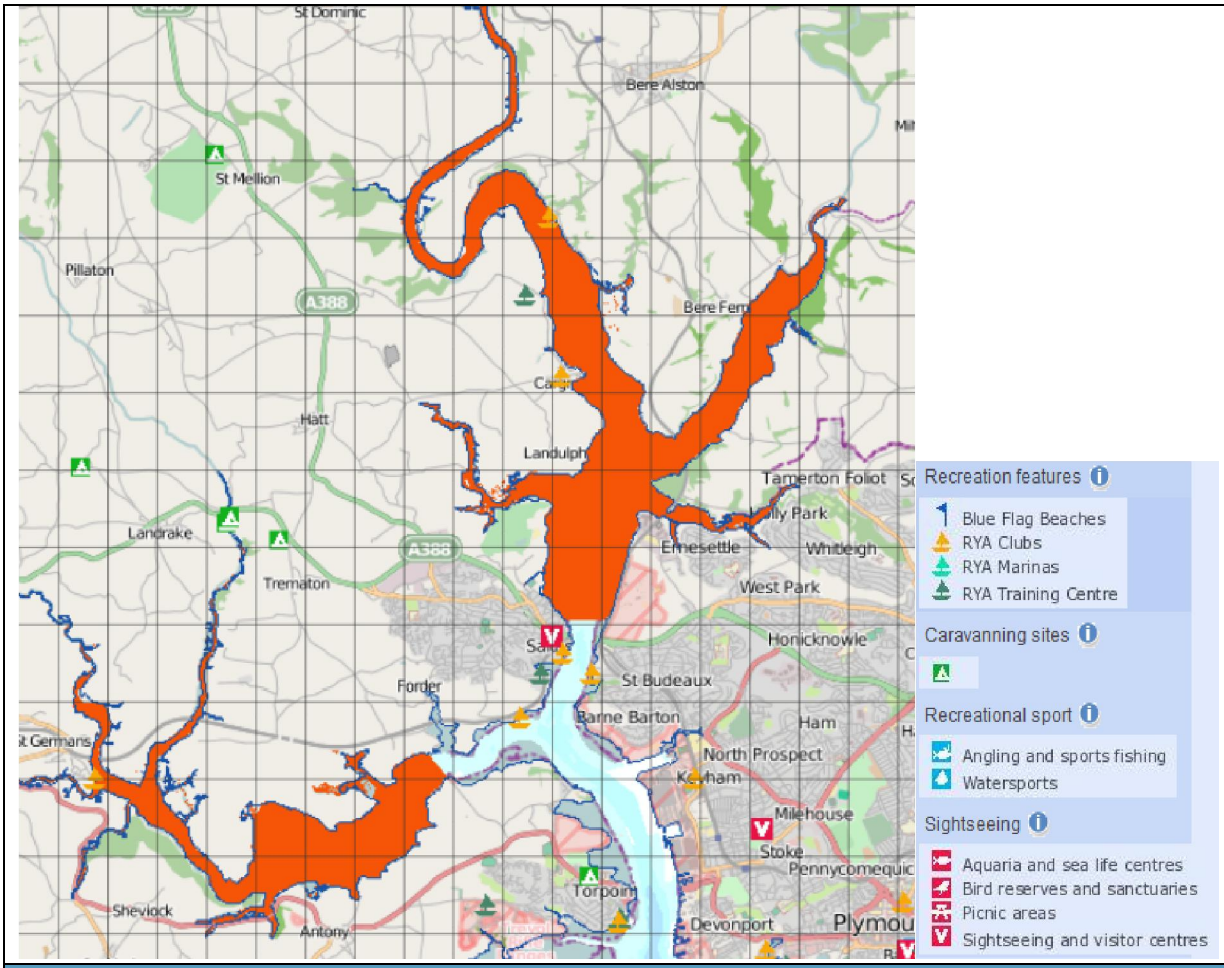


Figure 4-1: Facilities at Tamar Estuary for conducting recreational activities
Source:
Marine Management Organisation, Marine Planning Portal, accessed at:
http://planningportal.marinemanagement.org.uk/#

4.1.2 Step 1.2: Define conflicts among users

There are no reported conflicts among users. Data from the IA suggests that there may be low levels of fishing activity for bottom trawling in the sites and there may also be hand collection.

4.1.3 Step 1.3: Summary of recreational and tourism value under baseline

Table 4-4 below shows the type of activities and level of recreational use under each.

Table 4-4: Summary of activities and level of use	
Site name	**Tamar Estuary**
Regional project	**Finding Sanctuary**
Level of Use	**Activities**
Low use	Diving (scuba and snorkelling); wildfowling;
Moderate use	Board sports (windsurfing, surfing and kite boarding);
High use	Recreational angling; angling from charter boats; motorboats (jet skis and motorboats); general visits to the beach (strolling, sunbathing, picnicking, swimming, etc.);
Very high use	Walking/hiking; wildlife watching; paddle sports (kayaking, paddle boarding, canoeing, rowing); sailing;

The Tamar Estuary is used for recreation but is mainly popular and well known for a few recreational activities (walking, sailing and bird watching). The MMO marine planning portal does indicate the availability of a few caravanning sites. There also appears to be a moderate number of RYA clubs and training centres. As a result, Tamar Estuary is a **type 2 site**, **actively used for tourism and recreation but not considered to be a honeypot.**

4.2 Stage 2: Screening the impacts from designation and management on recreation and tourism

4.2.1 Step 2.1: Impacts on recreation and tourism from changes in the environment

Task 1: Identifying changes in the environment

The Tavy's intertidal mudflats in the upper estuary consist predominantly of silt and clay. The central and upper estuary consist of superficial bed sediments in the main channel, and the upper shores of both banks, when these are not saltmarsh, comprise a mixture of predominantly coarse, non-cohesive sediments with very small fractions of silt and clay. There are extensive mudflats on the western shore of the Hamoaze, in the Lyhner Estuary. These are believed to be in favourable condition.

There are blue mussel beds and native oysters in the rMCZ. Currently, their condition is regarded as favourable. Reef habitats occur within the Plymouth estuaries, comprising intertidal and subtidal low energy reefs, some of which are composed of limestone. These are also regarded to be in favourable condition.

Tamar Estuary is also important for both species of seahorse (*Hippocampus hippocampus* and *Hippocampus guttulatus*) (Lieberknecht and others, 2011, in Defra, 2012).

Tamar Estuary has also been proposed for designation for the native oysters and European eel but there is uncertainty regarding their conservation status. The conservation objectives are thus to be determined in the future. Table 4-5 summarises the features for designation, their conservation status under the baseline and their conservation objective, as given by Defra (2012).

Table 4-5: Changes in conservation status						
Site name	**Tamar Estuary**					
Regional project (if applicable)	**Finding Sanctuary**					
Features for designation	**Current conservation status**	**Area of feature (km^2)**	**Area of feature as a % of total area**	**No. of point records**	**Conservation objective (under Option 2 of the IA)**	**Additional notes, time for recovery, impacts off-site**
Broad-scale habitats						
Intertidal biogenic reefs	Favourable condition	0.01	0.07%	-	Recover to favourable condition	The conservation objectives have been changed from maintain to recover following SNCB advice thus confidence in the current conservation baseline can be regarded as low Recovery from 18 months to 3 years?
Intertidal coarse sediment	Favourable condition	0.04	0.27%	-	Recover to favourable condition	
Habitats of conservation importance						
Blue mussel beds	Favourable condition		-	1	Recover to favourable condition	As above 1-2 years recovery depending on condition
Species of conservation importance						
Ostrea edulis	Unfavourable condition	-	-	4	Recover to favourable condition	As above 2 to 4 years for recovery depending on conditions
Osmerus eperlanus	To be determined	-	-	-	Recover to favourable condition	
Anguilla anguilla	To be determined	-	-	-	Recover to favourable condition	

Task 2: Identification of recreational uses under baseline which would benefit from changes in environmental quality

Table 4-6 identifies links between the features (as given in the Table 4-5 above) and the specific recreational uses associated with them. As designation is expected to protect habitats and features supporting species with recreational values, positive impacts might be expected particularly for angling (with some potential benefits to wildfowling).

Table 4-6: Recreational uses benefiting from improvement in feature conservation status				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Feature/habitat	**Conservation objective**	**Supported species with recreational value**	**Other (time for recovery and impacts off-site MCZs)**	**Recreational use under baseline**
Intertidal biogenic reefs	Recover	Plaice, dab, flounders, mussels		Angling Most of these habitats and species support angling They may also some support wildfowling
Intertidal coarse sediment	Recover	-		
Blue mussel beds	Recover	Mussels		
Native oyster *Ostrea edulis*	Recover	Oyster		
Osmerus eperlanus	Recover		2 years approx [34]	
Anguilla anguilla	Recover		No data found	

4.2.2 Step 2.2: Impacts from management on recreational activities and tourism

Task 1: Impacts from management strategies on recreational uses

Information on management strategies gathered from the draft IA by Defra suggest that most activities will be unaffected by management (other than those requiring licence applications which may see an increase in costs of their environmental assessments). The change in conservation objective for this site (and all features within the site, including blue mussel beds/biogenic reefs) were recommended to change from "maintain" to "recover" based on water quality issues flagged for the estuary and not due to fishing activity pressures. This means no additional management costs for fishing activities due to this change in conservation objective are anticipated.

Task 2: Management of recreational activities

The draft IA notes that there will be no management of recreation.

[34] Keskinen et al (2012): Collapse and recovery of the European smelt (Osmerus eperlanus) population in a small boreal lake — an early warning of the consequences of climate change, Boreal environment research 17: 398–410

4.2.3 Step 2.3: Impact on recreation from improvements in services to visitors

The popularity of the site for various reasons and various activities indicate that increased services and facilities may be possible. Designation would 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.

Coastal walking is popular. Depending on the type of access and facilities there may be more recreational uses developing.

4.2.4 Step 2.4: Impact on recreation from promotion

Promotion can have an impact on existing users but also bring new users. These impacts are considered further under Stage 3.

4.2.5 Step 2.5: Impact on tourism

Tourism at the site is expected to create revenue. Activities which are likely to support business in this area are mainly related to sailing.

There are a number of alternatives to Tamar for informal recreation and sailing activities. South Devon is an AONB and sailing activities are recorded in Plymouth Sound and Estuaries SAC, which is an RYA sailing area. Whitsand and Looe Bay offer similar types of activities, in particular sailing and angling, as does Yealm estuary. The level of alternatives is thus considered to be low to moderate and some displacement is possible.

4.2.6 Step 2.6: Summary of screening

Table 4-7 presents the results of the screening exercise for the Tamar Estuary rMCZ.

Table 4-7: Results of impact screening				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Will designation likely lead to …	**Impact likely?**	**Recreational category affected**	**Tourism impacts?**	**Justification**
Conservation gains? (NB: habitats --> species with recreational value)	Yes	Anglers	Yes	There may be benefits from the protection of reefs that act as valuable habitats for species such as plaice, dab, flounders, mussels but these are mainly related to reduced fish mortality.
Improvement in relevant facilities? (NB: describe the type of	Yes	Informal recreation	N/A	The site has some facilities but these may be improved following designation.

Table 4-7: Results of impact screening				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Will designation likely lead to …	**Impact likely?**	**Recreational category affected**	**Tourism impacts?**	**Justification**
facilities that may be improved or provided)				
Promotion?	Yes	Most users	Yes	Designation would provide an additional positive aspect for the location. This could be used by the tourism and leisure industry to promote the area which would be expected to increase visitation rates.
Other impacts? (e.g. through management activities and/or reduction in conflict?)	No	N/A	N/A	Most activities will be unaffected by management.

4.3 Stage 3: Impact evaluation from designation and management on recreation

4.3.1 Step 3.1: Assessing the impacts on existing users

Step 3.1.1: Qualitative assessment of impacts

Table 4-8 (below) presents the results of the analysis for Tamar Estuary in qualitative terms. As shown below, the main benefits may arise to informal recreational users, whereas anglers may enjoy the conservation gains. In addition, promotion may make the site more attractive to visitors.

Table 4-8: Qualitative assessment of impacts on existing users			
Site name	**Tamar Estuary**		
Regional project	**Finding Sanctuary**		
Existing recreational activity	**Level of impacts on quality of the experience**	**Reasoning**	**Confidence assessment**
Walking/hiking	Moderate	Benefits could be linked to increased promotion and facilities and the perception that the site is protected increasing the quality of the experience.	Low
General visits to the beach (strolling, sunbathing, picnicking, swimming, etc.)	Moderate	As above.	Low
Bird watching	Moderate	The impacts will be linked to the conservation benefits although promotion of the site may help with the perception of the site resulting in a better quality of the experience.	Low
Recreational angling	Moderate	Anglers may benefit from the protection of specific habitats which are linked to fish species of recreational value.	Moderate
Board sports (windsurfing, surfing and kite boarding)	Small	Benefits could be linked to increased promotion and facilities and the perception that the site is protected increasing the quality of the experience. However, as the facilities are already regarded as good it is likely that the impacts will be small.	Moderate
Paddle sports (kayaking, paddle boarding, canoeing, rowing)	Small		
Sailing	Small	The area has a number of clubs so marginal benefits from additional promotion are unlikely.	Moderate
Motor sports	Small	As above.	Moderate

Step 3.1.2: Estimating the additional number of visits by existing users

The following table sets out the number of users for the different recreational categories under the baseline. This information is based on StakMap and MENE data.

Table 4-9: Estimating number of users affected				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Existing recreational activity	**Level of impacts**	**Number of current users /visits**	**Source of data**	**Level of confidence**
Informal recreation - walking/hiking; general visits to the beach (strolling, sunbathing, picnicking, swimming, etc.)	Moderate	29,820 visits	MENE – Number of visits to Tamar Estuary complex	Moderate. Data for 2010/11
Wildlife watching (bird watching)	Small	0	StakMap	Low. StakMap does not record wildlife watching at the site but it is believed to be undertaken
Recreational angling	Moderate	27.78	StakMap	Moderate. Figures appear to be low but further validation has not been possible in time for this study.
Board sports (windsurfing, surfing and kite boarding)	Small	300	StakMap	Low/Moderate.
Paddle sports (kayaking, paddle boarding, canoeing, rowing)	Small	445.53	StakMap	
Sailing	Small	902.72	StakMap	Moderate. Figures appear to be of the right order of magnitude, based on internet searches.
Motorboats (jet skis and motorboats)	Small	1002	StakMap	Moderate. As above

Table 4-10 summarises the assumptions made regarding the current level of use and the increment in the frequency of visits. The confidence in the assessment is low due to the assumptions that apply. Because there are no current estimates on the number of people practising wildfowling, this category is not carried on further. Thus, estimates of benefits will underestimate any potential benefits to this type of users. Similarly no data are available on level of usage for wildlife observation.

Table 4-10: Assessing additional visits per year							
Site name		Tamar Estuary					
Regional project		Finding Sanctuary					
Existing recreational activity	Current level of usage	Average number of trips per year under baseline	Additional number of trips per user		Additional number of trips per year (increase in average x number of users affected from changes)		Confidence assessment
			Low	Upper	Low	Upper	
Informal recreation	29,820 visits	N/A	N/A	N/A	1,491	2,982	Low- Assumes an increase of 5-10% based on the level of impacts, estimated as moderate.
Recreational Angling	28	7.67	0.4	0.8	11	21	Low- Current levels of use appear to be low. StakMap reports greater level of usage outside the rMCZ. Assumes an increase of 5-10% based on the level of impacts, estimated as moderate.

Step 3.1.3: Monetary valuation of benefits to existing users

Task 1: Travel costs based approach

Existing users will incur a travel cost for additional visits to the site. MENE does not provide any estimate for travel expenditure for Tamar Estuary; as a result, averages for Plymouth have been used. The estimates reveal small recreational benefits for anglers. This is likely to be due to the low level of usage reported by StakMap and also the low expenditure reported by MENE.

Table 4-11: Assessing recreational benefits to existing users (rounded to the nearest thousand)				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Recreational activity	**Average travel and parking spend (£ per trip)**	**Additional benefits to recreational users- revealed preference approach**		**Confidence assessment**
		Lower	**Upper**	
Informal recreation	£35.50 (average spend in Plymouth for general visits to the beach/coast)	£53,000	£106,000	Low/moderate: Samples for informal recreation are small with significant deviation among respondents.
Recreational angling	£4 (average spend for Plymouth for water sports)	-	-	Low: the number of recreational anglers appears low as does the expenditure (if compared with informal recreation). May underestimate the benefits but benefits are considered to be too small to value.

Task 2: Extended approach (applying consumer surplus for specific recreational categories)

In addition, there will be benefits to anglers and informal recreational users in terms of consumer surplus from the additional trips conducted. The values of £13.83 and £99.10[35] are applied to the additional number of trips (as the site has coastal access). The range of the benefits (rounded to the nearest thousand) is estimated in the table below.

Table 4-12: Assessing recreational benefits to existing users (rounded to the nearest thousand)				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Recreational activity	**Value**	**Additional benefits to recreational users- consumer surplus**		**Confidence assessment**
		Lower	**Upper**	
Informal recreation	£13.83	£21,000	£41,000	Low: The value is taken from the methodology and is the average between smaller sites with many alternatives and sites offering more significant recreational opportunities.
Recreational angling	£99.10	£1,000	£2,000	Low: The value is the average for a site with both boat based and shore based angling but number of users may be underestimated.

When changes in conservation status are expected to impact the diversity of species and the size of catch, additional values could apply to account for the change in conservation value. The value

[35] This is calculated as £87.11+£16.49-£4.50

taken here is £1.10 per trip applied across all trips (based on a moderate improvement). The benefits are calculated at around £250; thus they are negligible.

Task 3: Adjustment for displaced visits

Both Whitsand and Looe Bay and the Yealm estuary appear to be the main alternative for fishers, therefore there may be a transfer of visits from these two locations. According to StakMap the level of use is similar (although there appears to be more angling activity at Tamar Estuary, further down from the rMCZ).

However, since Whitsand and Looe Bay is also an rMCZ likely to be nominated in 2013, the displacement effect may not be as great. Yealm is a reference area covering a very small rocky strip in the mouth for the estuary. It would therefore be unlikely to create significant displacement.

There is thus a possibility that the above visits may be new visits and not displaced visits. As a result, the estimates can be considered a good proxy of the benefits to existing users.

4.3.2 Step 3.2: Estimating the impacts to new users

Step 3.2.1: Qualitative assessment of impacts

It is likely that promotion and designation may attract new users but the impacts are unlikely to be significant. Evidence from MENE suggests that the Yealm estuary attracts more visits per year. On the other hand, Whitsand and Looe Bay is likely to attract visitors too following its designation as an MCZ.

As a result, impacts are categorised as small and no further evaluation is considered.

4.3.3 Step 3.3: Summary of Impacts

The total recreational benefits for Tamar Estuary are estimated to range between £75k and £150k per year.

Table 4-13: Summary recreational benefits per year				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Recreational category-existing users	**Recreational benefits**		**Confidence**	**Summary of assumptions**
	Lower	**Upper**		
Informal recreation	£53,000	£106,000	Low	Based on additional travel expenditure. Assumes moderate impacts and increases in frequency of visits by existing users. Assumes no significant increases in the number of new users (as there are a number of alternative sites within the vicinity).
	£21,000	£41,000	Low	This reflects the additional consumer surplus from additional number of visits conducted. Same assumptions as above on increased frequency.
Recreational angling	£1,000	£2,000	Low	Consumer surplus from additional trips conducted.
TOTAL	**£75,000**	**£150,000**	Low	Due to assumption on increased frequencies. (NB: Totals may not add up due to rounding).

4.4 Stage 4: Impact evaluation from designation and management on tourism

4.4.1 Step 4.1: Qualitative assessment of impacts

The following table depicts the qualitative evaluation of impacts for the tourism sector.

Table 4-14: Qualitative assessment of tourism impacts			
Site name	**Tamar Estuary**		
Regional project	**Finding Sanctuary**		
Business affected/recreational uses	**Level of impacts due to new visits**	**Confidence assessment**	**Justification**
Catering sector	Moderate	Moderate	Impacts from the additional visits across all users

4.4.2 Step 4.2: Quantitative assessment of impacts

StakMap data does not report any charter boats for recreational angling.

Benefits will accrue more generally to shops and the catering sector, as mentioned in the above table.

4.4.3 Step 4.3: Monetary assessment of impacts

Table 4-15 presents the summary of impacts for the tourism sector. This is based on the average spend as reported by MENE for Plymouth. These values are applied to the additional number of trips in order to estimate the total annual benefits to the tourism sector.

Table 4-15: Tourism benefits				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Recreational category	**Average of spend on other items**	**Additional revenue to the tourism industry**		
		Lower estimate	**Upper estimate**	**Confidence assessment**
Informal recreation	£7.50	£11,000	£22,000	Low: The average spend relates to Plymouth and could be a good proxy as it may include spend by local/day visitors.
Total		**£11,000**	**£22,000**	Low: May underestimate benefits as expenditure appears to be low (also tourism benefits from anglers expected to be negligible)

4.5 Stage 5: Discounting and sensitivity analysis

4.5.1 Discounting

The following table depicts the value of the recreational and tourism benefits undiscounted. Most of the benefits for Tamar rMCZ are related to informal recreation because the site is popular among informal recreational users. Some benefits are expected to arise to recreational anglers but these are considered to be small.

Table 4-16: Tourism and Recreational benefits – UNDISCOUNTED benefits				
Site name	**Tamar Estuary**			
Regional project	**Finding Sanctuary**			
Recreational activity	**Tourism benefits and benefits to recreational users (revealed preference approach only)**		**Tourism benefits and benefits to recreational users (revealed preference PLUS consumer surplus approach)**	
	Low	**Upper**	**Low**	**Upper**
Informal recreation	£64,000	£128,000	£85,000	£169,000
Recreational angling	Negligible	Negligible	£2,000	£3,000
Total	**£64,000**	**£128,000**	**£86,000**	**£172,000**
Figures may not add up due to rounding				

In order to discount the benefits the following assumptions are undertaken:

1- Informal recreational benefits are assumed to start in year 3 following promotion and improvements of facilities and maximum benefits are expected to arise in year 6;
2- Benefits to anglers are not expected to be noticeable until year 8 and reach maximum benefits at year 15 from designation and implementation of management measures.

The discounted benefits are given in Table 4-17.

Table 4-17: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Tamar Estuary**	
Regional project	**Finding Sanctuary**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	**Low**	£976,000
	Upper	£1,951,000

4.5.2 Sensitivity testing

Due to the moderate level of confidence in the number of informal recreational users, it is not suggested to test for these types of users. On the other hand, there is greater uncertainty surrounding the number of recreational anglers. Because of this, the first sensitivity test assumes an increase in the number of anglers to 71 which is the maximum number of anglers among the grids as reported in StakMap. The second sensitivity test excludes consumer surplus.

Changes in number of recreational anglers

Increasing the number of recreational anglers under the baseline affected by designation will increase the recreational and tourism benefits to the site by around 3% which is not believed to be significant. Table 4-18 presents the result of this sensitivity test. Due to the significance of this test, the estimates under the main assessment appear to be robust for the number of anglers affected by designation but larger number of users affected may have a greater impact on the scale of the benefits.

Table 4-18: Sensitivity test 1: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Tamar Estuary**	
Regional project	**Finding Sanctuary**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	**Low**	£993,000
	Upper	£1,978,000

Exclusion of consumer surplus

Exclusion of consumer surplus will also have a moderate impact on the level of recreational impacts reducing them by around 25%. This is mainly due to increased consumer surplus to informal recreational users. Further validation on the increased frequency of visitation and consumer surplus may be needed to verify the inclusion of this type of benefits.

Table 4-19: Sensitivity test 2: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Tamar Estuary**	
Regional project	**Finding Sanctuary**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users (revealed preference approach only)	**Low**	£733,000
	Upper	£1,465,000

5 Folkestone Pomerania

5.1 Stage 1: Baseline definition

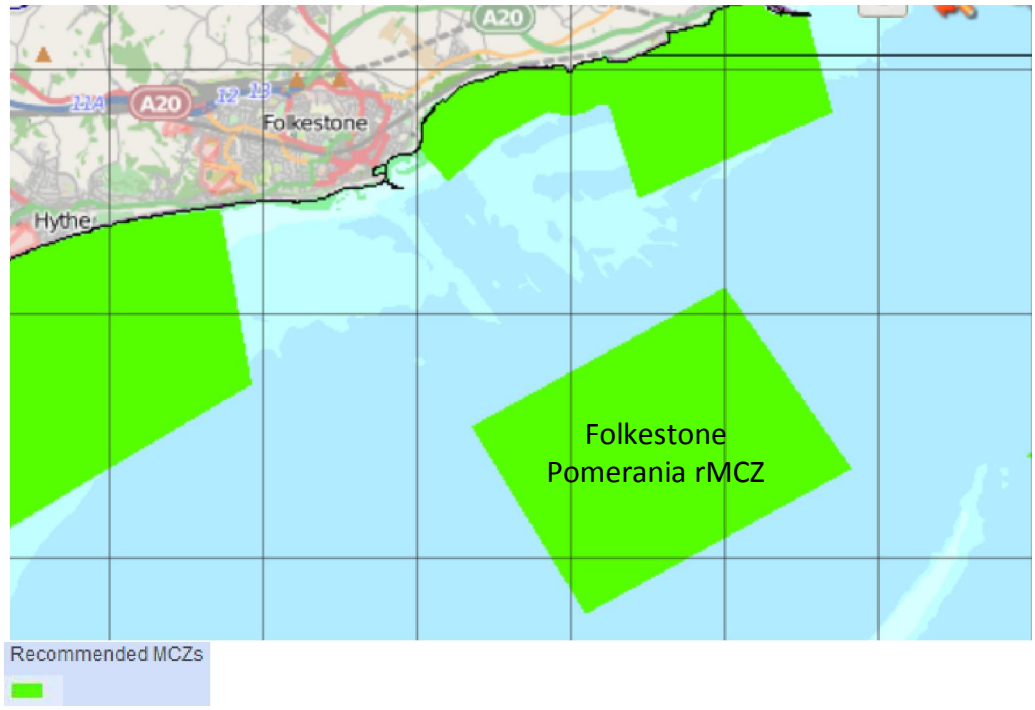
Folkestone Pomerania rMCZ is around 6 km off the coast of Folkestone and varies in depth from 22 to 30 metres. It covers a roughly rectangular area within which there is a diverse array of species and habitats, two of which only occur at one other location within the region. The closest town is Folkestone, with Hythe and Dover also providing access to the site. There is no current designation of any sites within the vicinity of Folkestone Pomerania however there is a site along the Hythe coast which is up for designation as an MCZ.

The most significant features present at this rMCZ other than those of conservation interest, are the wrecks which can be found here, and which are popular with divers and for wreck fishing.

The main features for designation of this site include; broad scale habitats on the sea bed, including significant areas of subtidal course sediments, and habitats of conservation importance, fragile sponge and anthozoan communities and reef communities which are found infrequently elsewhere. These areas are predicted to support a diverse variety of marine fauna when they are in favourable condition.

Table 5-1 shows basic information for Folkestone Pomerania.

Table 5-1: Basic information about rMCZ	
Site name	**Folkestone Pomerania**
Regional project	**Balanced Seas**
Area	33.71 km^2
Depth Range	~ 22-30 m
Type of site	Inshore
Overlaps with existing MPA (SPAs, SACs, SSSIs, RAMSAR	**International Designation**
	Currently there are no international designations which overlap with Folkestone Pomerania
	National Designations
	The Folkestone Pomerania rMCZ does not overlap with any national designations; however there is a recommended MCZ reference area within the site.

sites)	

Sources:
Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013; Annex A1 – Part 1. – Balanced Seas – Sites proposed for designation in 2013

Marine Management Organisation, Marine Planning Portal, accessed at: http://planningportal.marinemanagement.org.uk/#

Balanced Seas (2011): Folkestone Pomerania rMCZ no 11.4, Marine Conservation Zone: Selection Assessment Document

5.1.1 Step 1.1: Define recreational uses and tourism activities

Folkestone Pomerania rMCZ is inshore but it is not coastal and therefore does not have the same level of recreational use as coastal areas due to the reduced accessibility to the site. However it is still popular with tourists for a variety of activities. Table 5-2 shows the recreational activities undertaken currently within the Folkestone Pomerania area.

The main tourist attraction at Folkestone Pomerania is diving. There are a variety of dives within this site, the most well-known of these being to the wreck of the SS Pomerania[36]. Named and dated wrecks of British, German, French, Dutch, Danish and Norwegian origin are present as well as several unidentified wrecks. There is also a World War I German submarine and a World War II aircraft37. Wreck diving is the most popular type of diving in this area[38].

[36] Medway sub-aqua club: Adopted wreck – the SS Pomerania, accessed at http://www.med-sac.co.uk/adopted-wreck---ss-pomerania.html

[37] Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013, Annex I2 Direct impacts arising from individual rMCZs (Option 2)

[38] Mutiny Diving: "Mutiny Diving" (Dover & Folkestone Wreck Diving Specialists), accessed at http://www.mutiny-diving.com/

Table 5-2: Level of activities at the site		
Site name	**Folkestone Pomerania**	
Regional project	**Balanced Seas**	
Recreation categories	**Subcategories**	**Level of use**
Wildlife observation	Bird watching	Low use
	Cetacean watching	Low use
	Seal watching	Low use
Water sports	Recreational diving	High use
	Recreational angling	High use
	Sailing	High use
	Motorboats	Low/moderate use
Other recreation	Other recreational pursuits are not known to occur specifically within the rMCZ; however, recreational traffic will pass through in transit to other destinations or on its way to Dover or Folkestone Harbour	Low/moderate use
Sources: Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013, Annex I2 Direct impacts arising from individual rMCZs (Option 2) Marine Management Organisation, Marine Planning Portal, accessed at: http://planningportal.marinemanagement.org.uk/# *Based on potential for these activities to occur		

Information on other important site characteristics which affect visitor numbers are recorded in Table 5-3.

Table 5-3: Attributes affecting visitor numbers		
Site name	**Folkestone Pomerania**	
Regional project	**Balanced Seas**	
Attribute	**Level**	**Description**
Facilities at the site (for activity)	Moderate	Folkestone Pomerania rMCZ is approximately 6 km offshore and covers various wrecks which are frequented by dive clubs and dive schools. Although there are no facilities at the site itself due to its geographical location, there are facilities on the coast.
Access to the site (travel opportunities)	Low	Folkestone Pomerania rMCZ is approximately 6 km offshore and therefore it is only accessible by boat.
Awareness of the site	Moderate	Folkestone Pomerania rMCZ is approximately 6 km offshore and relatively inaccessible, therefore it is less known to the public. However divers frequent the site for wreck dives.

Despite the low score for access to the site the transport links to most parts of Kent are relatively good with the M25, M20 and A2/M2/A299 corridors. However the perception of the M25 as a barrier and congestion often reduce accessibility. The rail network enables most parts of the county to be reached, however travel times can be poor and often the links with buses and taxis is lacking at

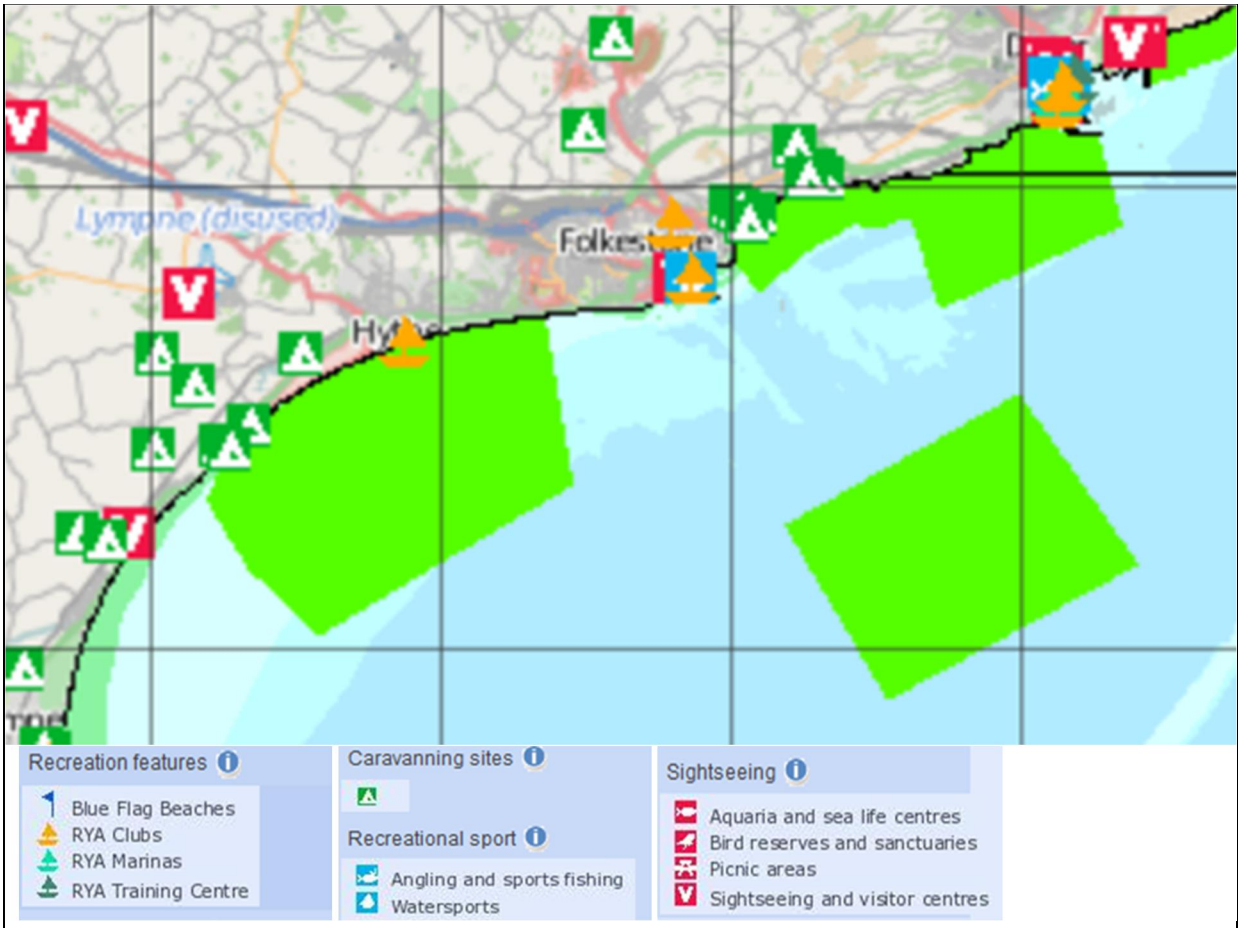
train stations. There is now a one hour connection to London which has resulted in an influx of investment to the area[39].

The site lies within the inshore zone but there are no direct links to land and hence there are no facilities 'on site', but there are facilities in the nearest coastal towns (the closest being Folkestone, then Hythe and Dover) and the presence of facilities at these sites may indicate the level of recreational use in the inshore waters. Table 5-4 presents the facilities listed along the coast from Hythe to Dover.

Table 5-4: Baseline facilities		
Site name	**Folkestone Pomerania**	
Regional project	**Balanced Seas**	
Facilities	**Number**	**Recreational activities**
Angling and sport fishing centres	2	The area is popular for private boat angling and charter boat fishing. It is mainly used for wreck fishing.
Sightseeing and visitors centres	7	There are a variety of tourist information centres within the Hythe to Dover area.
Water sports training facilities	2	The rMCZ is a popular spot for wreck and general diving.
Camping and caravanning sites	10	The area has a large number of camping and caravanning sites which encourage informal recreation along the coast.
RYA clubs[+]	5	Sailing and motorboats sites are mainly based in Folkestone and Dover.
RYA marinas[+]	1	
RYA training centres+	4	
Source: Marine Management Organisation, Marine Planning Portal, accessed at: http://planningportal.marinemanagement.org.uk/# [+]Despite the prevalence of Royal Yachting Association (RYA) facilities within the area the rMCZ does not cover any of their sailing, racing or cruising areas		

Figure 5-1 shows the facilities available along the coast from Hythe to Dover.

[39] Kent County Council (2009): Kent and Medway Tourism Development Framework



Source:
Marine Management Organisation, Marine Planning Portal, accessed at:
http://planningportal.marinemanagement.org.uk/#

Figure 5-1: Baseline facilities near Folkestone Pomerania

Within the Folkestone area other facilities include a 100 room Holiday Inn Express opened within the last five years which provides accommodation to recreational users of the area. There is also a large car parking area in Hythe for 1,500 cars. Visitors are attracted by a variety of facilities and activities within Folkestone itself, such as:

- The Relish, which is a well-known restaurant within the area;
- Folkestone Race Course, which holds 20 days of Flat and National Hunt racing a year; and
- Folkestone Triennial, which is a cultural festival of visual arts which began in 2008, and has an estimated attendance of 25,000 people[40].

5.1.2 Step 1.2: Define conflicts among users

Table 5-5 shows current non-recreational users within and around the Folkestone Pomerania rMCZ area.

[40] Kent County Council (2009): Kent and Medway Tourism Development Framework

Table 5-5: Non-recreational uses and interactions with recreational uses	
Site name	**Folkestone Pomerania**
Regional project	**Balanced Seas**
Non-recreational uses	**Brief description**
Marine archaeology	Named and dated wrecks of British, German, French, Dutch, Danish and Norwegian origin are present within the rMCZ site as well as several unidentified wrecks. There is also a World War I German submarine and a World War II aircraft.
Commercial fisheries	This site is within 6 nm of the shore and is fished only by UK vessels. The main commercial fishing fleets operating in the site are based in Folkestone and Dungeness. The most important fisheries for vessels below 15 metres are static nets, scallop dredging, bottom trawling and potting. Several larger UK trawlers/beam trawlers have historical 'grandfather rights' to fish between 3 nm and 6 nm and have a different quota allocation to the smaller local trawlers. There are three Brixham vessels with 'grandfather rights' to this area, but these are likely to gradually cease operating. The site is small and activity is limited due to the geography and adjacent shipping channels. The main activities are netting for bass, and potting for lobsters and crabs. Effort in a trap fishery for cuttlefish is increasing because cuttlefish are a non-quota species. A number of commercial fishing restrictions are already in existence. Estimated annual value of landings from the rMCZ is £0.062 million per year.
Shipping	There is an IMO shipping route which passes through a small area of the rMCZ which represents a moderate level of shipping density.
Sources: Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013, Annex I2 Direct impacts arising from individual rMCZs (Option 2) Marine Management Organisation, Marine Planning Portal, accessed at: http://planningportal.marinemanagement.org.uk/#	

Additional considerations of uses of the rMCZ area which are not currently significant but have potential to become more so in the future, are:

- Oil and gas related activities: this rMCZ overlaps with an area that has potential for future oil and gas exploration and production however, the area is not necessarily viable to develop. There is no current oil or gas related activity here;
- Disposal sites: there is licensed disposal at two sites (East Wear Bay and Sandgate Bell) within 5 km of the rMCZ; there are no anticipated licence applications. These sites are not close enough to have significant impacts on the rMCZ;
- Water abstraction, discharge and diffuse pollution: there are no water abstraction, discharge or diffuse pollution sites within the rMCZ, however there are several consented discharge sites within the area, two of which are within 6 nm of the rMCZ;
- Aquaculture: the nearest aquaculture site to the rMCZ is around 20 nm away and is for manila clam, native oyster and pacific oyster shellfish production. At this distance it is unlikely to have much of an impact on the rMCZ area;
- Marine aggregate dredging: there is no aggregate extraction within the rMCZ, however it is a popular route for aggregate dredgers;
- Research and education: no known formal research activities are currently carried out in the rMCZ. However, ferries crossing the channel may be used by marine mammal observers

whose data contribute to national databases. No known education activity occurs within the MCZ.

Based on the information above the main areas of potential conflict within the rMCZ occur between commercial fisheries and recreational activities.

5.1.3 Step 1.3 Summary of recreational and tourism value under baseline

Table 5-6 shows the type of activities and level of recreational use under each.

Table 5-6: Summary of activities and level of use	
Site name	**Folkestone Pomerania**
Regional project	**Balanced Seas**
Level of use	**Recreational activity**
Low use	Wildlife watching (birds, cetaceans and seals)
Moderate use	Water sports (motorboats)
High use	Water sports (recreational non-extractive diving, recreational angling, sailing)

Folkestone Pomerania rMCZ is classed as a **type 3 site, i.e. the site is not actively used for tourism and recreation but it has potential for recreational activities to be developed via additional promotion and/or investment in facilities**. Using information from the report by Natural England 'Monitor of Engagement with the Natural Environment (MENE)' it is possible to see that the area between Hythe and Dover attracted 1.8 million visitors in 2012. The area with the most visits in this period was Folkestone with 76,150 visits to the coast for informal recreation, mainly from the local area. Fishing visits only took place in Hythe and Dover and wildlife watching visits only went to Dover. Visits to Folkestone were mainly general visits to the beach for informal recreation such as sunbathing, paddling, etc. Based on this information it is likely that the visits to the rMCZ area of Folkestone Pomerania took place mainly from Dover and Hythe rather than Folkestone itself. This information is shown in Table 5-7.

Table 5-7: Summary of recreation within the Folkestone Pomerania area (Hythe to Dover) and value under the baseline					
	Number of visits				
	Informal recreation	Fishing	Wildlife watching	Water sports	Average distance travelled
2009/2010					
Hythe	546,680	26,000	26,180	27,300	16.34 miles
Folkestone	466,060	0	0	46,770	6.86 miles
Dover	206,330	0	77,510	0	9.14 miles
2010/2011					
Hythe	189,680	0	43,520	0	5 miles
Folkestone	441,590	0	45,280	0	4.63 miles
Dover	280,260	0	0	0	9.4 miles
2011/2012					
Hythe	465,720	37,970	0	0	10.31 miles
Folkestone	1,006,180	0	0	0	7.38 miles
Dover	216,630	50,750	24,230	0	21.92

Table 5-7: Summary of recreation within the Folkestone Pomerania area (Hythe to Dover) and value under the baseline
Source: Natural England: Monitor of Engagement with the Natural Environment (MENE)

The information in Table 5-7 highlights the fact that most visitors to the coastal area between Hythe and Dover are visiting for informal recreation which will not include visits to the rMCZ area. With regards the activities mentioned, fishing and water sports are likely to have the greatest direct impacts on Folkestone Pomerania; wildlife watching may also impact the rMCZ, although there is no distinction between land and marine based wildlife watching making it difficult to discern whether the visitors will be travelling to the rMCZ area or not.

5.2 Stage 2: Screening the impacts from designation and management on recreation and tourism

5.2.1 Step 2.1: Impacts on recreation and tourism from changes in the environment

Task 1: Identifying changes in the environment

This step examines the direct effects of the designation on environmental features within the rMCZ of Folkestone Pomerania. Designation of the site aims to improve features currently in "unfavourable condition" to "favourable condition". Table 5.8 shows the features within the rMCZ for designation and their conservation objectives.

Table 5-8: Changes in conservation status				
Site name	**Folkestone Pomerania**			
Regional project	**Balanced Seas**			
Feature	**Area of feature or no. of point records**	**Condition without designation (baseline)**	**Conservation objective**	**Additional notes, time for recovery, impacts off-site**
Moderate energy circalittoral rock	1.6 km^2	Unfavourable	Recover to favourable	Medium to long term recovery time (up to 50 years[1]).
Subtidal coarse sediment	24.6 km^2	Favourable	Maintain as favourable	Impacts off-site expected as the area of the feature covers a large proportion of the rMCZ. Short to medium term time for recovery (one to 20 years[2]).
Subtidal sand	7.1 km^2	Unfavourable	Recover to favourable	Short to medium recovery time (one to 20 years[3]).
Blue mussel *Mytilus edulis* beds	312.6 m^2	Unfavourable	Recover to favourable	OSPAR and BAP habitat – UK obligation for protection. Currently in decline on a wider scale, provides a functional habitat. Impacts may be felt off-site. Short to medium recovery time (one to 20 years[4]).
Fragile sponge and anthozoan communities	3 records	Unfavourable	Recover to favourable	One of only two regional occurrences of this feature. BAP habitat with a UK obligation for protection. Contains key species and provides a functional habitat. Long term recovery time (50 years or longer[5]).
Honeycomb worm reef *Sabellaria alveolata*	0.01 km^2	Unfavourable	Recover to favourable	One of only two occurrences of this feature. BAP habitat. Medium term recovery time (five to 20 years[6]).
Rossworm reef *Sabellaria spinulosa*	0.07 km^2	Unfavourable	Recover to favourable	Supports unusual associated biotopes on mud habitats not seen elsewhere in the region. Medium term recovery time (five to 20 years[7]).
Subtidal sands and gravels	29.2 km^2	Unfavourable	Recover to favourable	Medium to long term recovery time (five to 50 years[8]).

[1] This feature is inhabited mainly by slow moving species such as starfish and sea urchins, and characterised by mussel beds and worm reefs

[2] Species found here include bristle worms, sand mason worms, small shrimp-like animals, burrowing anemones, carpet shell clams and venus cockles, these have a relatively long

Table 5-8: Changes in conservation status

recolonisation time

[3] This feature is inhabited by species such as flat fish and sand eels (which are mobile species and could recolonize the area quickly) as well as less mobile species, including razor shells and sea cucumber

[4] Blue mussels take at least five years to recover from damage

[5] These communities are dominated by large, slow growing species such as branching sponges and sea fans

[6] After damage honeycomb reefs may die back for several years, however the presence of existing or dead remains of worm colonies stimulates more larvae to settle there

[7] These reefs are formed by Rossworms settling on hard substrate. It requires time to build up a reef however larvae are stimulated to settle where there are already adults or juveniles present

[8] This feature may be composed of a variety of worms, sea snails, bivalves and anemones. These species are relatively slow to colonise new areas

Sources:

Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013, Annex A1 – Part 1. – Balanced Seas – Sites proposed for designation in 2013

Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013, Annex I2 - Direct impacts arising from individual rMCZs (Option 2)

Natural England: The Marine Conservation Zone Project – Features Catalogue, accessed at http://www.naturalengland.org.uk/ourwork/marine/mpa/mcz/features/default.aspx

Task 2: Identification of recreational uses under baseline which may benefit from changes in environmental quality

The increase in biodiversity of species within the area brought about by designation is expected to provide benefits to recreational anglers and divers. It may also benefit wildlife watchers as a greater variety and quantity of species within the area may attract cetaceans, seals and sea birds to feed. Designation may introduce minor restrictions on recreational activities, for example anchoring restrictions or restrictions on potting, however this is unlikely to significantly affect recreational activities and therefore has not been considered within this case study. The main activities within the rMCZ at present and the potential impacts of designation on these activities are shown in Table 5-9.

Table 5-9: Recreational uses benefiting from improvement in feature conservation status			
Site name	**Folkestone Pomerania**		
Regional project	**Balanced Seas**		
Feature	**Conservation objective**	**Examples of supported species**	**Sectors benefiting**
Moderate energy circalittoral rock	Recover	Animal communities on the seabed Nursery areas for young fish Feeding areas for predators such as cetaceans, seals and sea birds	Wildlife watching (birds, cetaceans and seals) Recreational fisheries Recreational diving
Subtidal course sediment	Maintain		
Subtidal sand	Recover		
Blue mussel *Mytulis edulis* beds	Recover		
Fragile sponge & anthozoan communities	Recover		
Honeycomb worm *Sabellaria alveolata* reef	Recover		
Rossworm *Sabellaria spinulosa* reef	Recover		
Subtidal sands and gravels	Recover		
Sources: Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013, Annex I2 Direct impacts arising from individual rMCZs (Option 2)			

5.2.2 Step 2.2: Impacts from management on recreational activities and tourism

Task 1: Impacts from management strategies on recreational uses

Feature conservation will improve the quality of the experience within the rMCZ for recreational users, but management of activities may also have negative impacts on users. Management scenarios suggested for non-recreational users are detailed in Table 5-10.

Table 5-10: Impact of potential management strategies on recreation and tourism		
Site name	**Folkestone Pomerania**	
Regional project	**Balanced Seas**	
Management scenario	**Details**	**Impacts on specific habitats and recreational users**
Archaeological heritage	Increase the cost of assessing environmental impacts for future licence applications. 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, including *Sabellaria* reef	Anchoring restrictions will avoid disturbance and destruction of *Sabellaria* reefs which may benefit divers and, indirectly, wildlife watchers and anglers.
Commercial fisheries (due to uncertainty about whether additional management will be required, 2 scenarios have been employed)	Management scenario 1: Closure of the entire rMCZ to bottom trawls and dredges to protect areas of Ross worm *Sabellaria spinulosa* reef and honeycomb worm *Sabellaria alveolata* reef	Ross worm *Sabellaria spinulosa* reef and honeycomb worm *Sabellaria alveolata* reef will recover which may lead to benefits to divers and, indirectly, wildlife watchers and anglers.
	Management scenario 2: Closure of the entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps to protect areas of moderate energy circalittoral rock, blue mussel *Mytilus edulis* beds, fragile sponge and anthozoan communities, Ross worm *Sabellaria spinulosa* reef and honeycomb reef worm *Sabellaria alveolata* reef	Recreational anglers may be negatively impacted, however divers and wildlife watchers will benefit. And it is expected that off-site benefits will be felt by recreational anglers.
Source: Defra (2012): Marine Conservation Zones: Consultation on proposals for designation in 2013, Annex I2 Direct impacts arising from individual rMCZs (Option 2)		

This site is small and activity is limited due to the geographic location and adjacent shipping channels, however management scenarios are still put forward and may have significant effects. Based on information presented to this point, management of non-recreational users due to designation would improve the quality of the experience of recreational users such as divers, anglers and wildlife watchers.

Task 2: Management of recreational activities

There may be some restrictions on anchoring but it is unlikely that these will affect recreational users significantly.

5.2.3 Step 2.3: Impact on recreation from improvements in services to visitors

As this site is not coastal and requires boats for access, any improvements in marine facilities such as launching points, piers or marinas within the area may increase the recreational use at the rMCZ. At present there are two angling and sport fishing centres within the area and two water sport training

facilities. An increase in these recreational facilities may increase the accessibility and popularity of the Folkestone Pomerania site.

There are currently ten camping and caravanning sites onshore, so further improvements in this type of service is unlikely to have significant impacts on visitors.

5.2.4 Step 2.4: Impact on recreation from promotion

Designation of the rMCZ will lead to promotion opportunities which will impact both existing users and bring new users, particularly wildlife watchers, recreational divers and anglers. Designation is likely to improve investment in knowledge provision or promotion of the site, for example boats which take out wildlife watchers, anglers and divers may produce more information for customers on the benefits provided to them by designation of the site and the increased appeal of it. Local tourist information offices may also provide leaflets and guides to attract people to the area and may include a specific section on their websites. Regarding specific promotion of the wildlife watching benefits of designation, wildlife trusts and the RSPB may promote the area more once it is designated.

In combination these increases in the promotion of the Folkestone Pomerania rMCZ are likely to increase the number of visits to the area as a greater awareness of the site leads to existing users visiting more often and new users being attracted.

5.2.5 Step 2.5: Impact on tourism

There are a number of historic wrecks around Folkestone rMCZ that are only accessible by boat. Recreational angling and sailing also take places outside the nominated area (with sailing activities being more popular to the east of the recommended site). Thus, the number of alternatives is recorded as moderate to high.

5.2.6 Step 2.6: Summary of screening

The following table presents the results of the screening exercise for Folkestone Pomerania.

Table 5-11: Results of impact screening				
Site name	**Folkestone Pomerania**			
Regional project	**Balanced Seas**			
Designation leading to…	**Impact likely**	**Recreational category affected**	**Tourism impacts**	**Justification**
Conservation gains	Yes	Divers Anglers Wildlife watchers	Yes	Designation will protect features of conservation importance and therefore will improve the conservation status of the area. This will increase the recreational value of the area for specific groups of users.
Improvement in relevant facilities	Potential			Increase in boating facilities may increase the ability of divers, anglers and wildlife watchers to go out to the rMCZ site.
Promotion	Yes			As the main users of the site are likely to find the site more attractive after designation it is likely that local organisations involved in arranging charter boats for angling, diving and wildlife watching will use designation as a means of promotion. Local wildlife groups may also promote the site.
Other	Yes			The closure of part or all of the MCZs to bottom trawls, dredges, lines, nets, pots and traps is likely to benefit recreational groups by improving the quality of their experience within the area but these impacts are captured under conservation gains.

5.3 Stage 3: Impact evaluation from designation and management on recreation and tourism

5.3.1 Step 3.1: Assessing the impacts on existing users

Step 3.1.1: Qualitative assessment of impacts

Table 5-12 presents the results of the qualitative analysis for Folkestone Pomerania.

Table 5-12: Qualitative assessment of impacts on existing users to Folkestone Pomerania			
Site name	**Folkestone Pomerania**		
Regional project	**Balanced Seas**		
Existing recreational activity	**Level of impacts on quality of the experience**	**Reasoning**	**Confidence assessment**
Wildlife observation (bird, cetacean and seal watching)	Moderate	The impacts will be linked to the conservation benefits although promotion of the site may help with the perception of the site resulting in a better quality of the experience. There could be benefits to wildlife watchers, divers and anglers as a result of the conservation gains to habitats supporting specific species with recreational value.	Moderate
Recreational diving			
Recreational angling			
Sailing	Small	Designation is unlikely to have any significant effect for these recreational users. Improvements of facilities are possible but more likely for recreational angling (as the site is popular for private boat angling and charter boat fishing).	Low
Motorboats			

Table 5-12 shows that recreational users likely to feel the most significant impacts from designation of the rMCZ are wildlife watchers, anglers and divers. The small impacts felt by sailing and motorboat users within the area mean that these impacts do not warrant quantification.

Step 3.1.2: Estimating the additional number of visits by existing users

Table 5-13 presents the number of users for the different recreational categories under the baseline. The information is based on StakMap data.

Table 5-13: Estimating the number of users affected				
Site name	**Folkestone Pomerania**			
Regional project	**Balanced Seas**			
Existing recreational activity	**Level of impacts on quality of the experience**	**Number of current users**	**Source of data**	**Confidence assessment**
Wildlife observation (bird, cetacean and seal watching)	Moderate	0	StakMap	Low. None recorded on StakMap.
Recreational diving	Moderate	210	StakMap	Low (may be higher as StakMap does not record divers on charter boats). Consultation has suggested that 210 which is the maximum value reported by StakMap may be more appropriate than the average of 113 reported as an average[41].
Recreational angling	Moderate	2,718	StakMap	Moderate. Mostly anglers carried on charter boats (2,574 on charter boats, 144 on private boats).
Source :Marine Management Organisation, Marine Planning Portal, accessed at: http://planningportal.marinemanagement.org.uk/#				

Based on the information presented above, assumptions as to the increase in frequency of visits due to conservation gains and promotion can be formed. Due to the use of assumptions the confidence levels are low. Results are presented below in Table 5-14. As there is no data on the numbers of wildlife watchers visiting the site this group has not been included in these tables. Because the impacts are expected to be low, a maximum increase of 10% in the number of visits has been assumed.

Table 5-14: Assessing additional visits per year							
Site name	**Folkestone Pomerania**						
Regional project	**Balanced Seas**						
Existing recreational activity	**Number of current users**	**Average number of trips per year under baseline**	**Additional number of trips per user**		**Additional number of trips per year (increase in average x number of users affected from changes)**		**Confidence assessment**
			Lower	**Upper**	**Lower**	**Upper**	
Recreational diving	210	3.62	0.2	0.4	38	76	Low/moderate: Assumes an

[41] Bryony Chapman, Marine Policy Officer for Kent Wildlife Trust (pers. Comm. 2013).

Table 5-14: Assessing additional visits per year							
Recreational angling	2,718	2.13	0.1	0.2	289	579	increase of 5-10%. Average participation given by survey of users (ibid).

Step 3.1.3: Monetary valuation of benefits to existing users

Task 1: Travel costs based approach

Existing users will incur a travel cost for additional visits to the site. The costs, based on the assumptions above, are calculated in Table 5-15. These are assumed to represent the recreational benefits to existing users from increased visitation related spend.

Table 5-15: Assessing recreational benefits to existing users				
Site name	**Folkestone Pomerania**			
Regional project	**Balanced Seas**			
Recreational activity	**Average travel and parking spend (£per trip)**	**Additional benefits to recreational users- revealed preference approach**		**Confidence assessment**
		Lower	**Upper**	
Recreational diving	75*	£3,000	£6,000	Low/moderate: Travel costs based on a very limited sample from MENE and could overestimate costs (but they may include the costs to getting to the site, i.e. own boat use/charter boat hire). On the other hand this may overcompensate for the low figures reported in StakMap for number of users.
Recreational angling[+]	75	£22,000	£43,000	
Notes: *No information for diving costs therefore has been assumed to be the same as angling as similar facilities regarding travel and parking are likely to be available to the two groups [+] Spend category is 'fishing' Source: Natural England: Monitor of Engagement with the Natural Environment (MENE) (data for 2011/2012)				

Task 2: Extended approach (applying consumer surplus for specific recreational categories)

The only estimates available for the above categories for consumer surplus are for recreational angling. Because the site is popular for charter boat angling, the value selected for estimating consumer surplus from additional visits is £105.26 per trip. This assumes costs of £24.36. The

consumer surplus for Folkestone Pomerania is thus estimated at £54.62 per angling day. The additional benefits are estimated to range between £16,000 and £32,000 per year.

When changes in conservation status are expected to impact the diversity of species and the size of catch, additional values could apply to account for the change in conservation value. The value taken here is £1.10 per trip applied across all trips (based on a moderate improvement, greater diversity of catch). The benefits are estimated at around £7,000 per year.

Task 3: Adjustment for displaced visits

As there are alternative sites within the area, it is possible that these values refer only to a transfer of visits instead of new visits. It is considered that designation could mean a transfer of visits of up to 40% (low to medium displacement). The net benefits are set out in Table 5-16.

5.3.2 Step 3.2: Estimating the impacts to new users

Due to the presence of alternative sites nearby it is likely that many new users to the rMCZ site of Folkestone Pomerania will be transfers from others sites. Genuine new users from elsewhere are also likely but they will not contribute a significant number of visits.

5.3.3 Step 3.3 Summary of impacts

The benefits of designation of Folkestone Pomerania rMCZ are predicted to range between £31k and £55k.

Table 5-16: Assessing recreational benefits to existing users				
Site name	**Folkestone Pomerania**			
Regional project	**Balanced Seas**			
Recreational category	**Recreational benefits**		**Confidence**	**Summary of assumptions/method**
	Low	**High**		
Recreational diving	£2,000	£3,000	Low	Based on travel costs estimates for additional trips
Recreational angling	£13,000	£26,000	Low	Based on travel costs estimates for additional trips.
	£9,000	£19,000	Low	Consumer surplus for additional trips, based on benefits value of charter boat based angling.
	£7,000	£7,000	Low	Consumer surplus across all trips for conservation gains.
Total	**£31,000**	**£55,000**	Low	Travel costs estimates appear to be high.

5.4 Stage 4: Impacts evaluation from designation and management on tourism

5.4.1 Step 4.2: Qualitative assessment of impacts

Table 5-17 presents the qualitative evaluation for the tourism sector for the rMCZ area of Folkestone Pomerania. The main benefits are to accrue to charter boats.

Table 5-17: Qualitative assessment of tourism impacts			
Site name	**Folkestone Pomerania**		
Regional project	**Balanced Seas**		
Business affected/recreational uses	**Level of impacts due to new visits**	**Confidence assessment**	**Justification.**
Charter boats (for wildlife watchers, anglers and divers)	Moderate	Moderate	StakMap records no divers carried on charter boats. StakMap records significant numbers of anglers on charter boats. These will generate revenue but the increases in visitation are not expected to be significant.
Catering sector	Small	Moderate	Impacts from the additional visits across all users are expected to be small (as they will represent a transfer from nearby sites).

5.4.2 Step 4.2: Quantitative assessment of impacts

There are charter boats operating within the Folkestone Pomerania area, as well as dive clubs and angling clubs, but the total number of these is not known. There are two angling and sport fishing centres within the area.

5.4.3 Step 4.3: Monetary assessment of impacts

No data on costs for Folkestone or Shepway is available from the MENE data. As a result, the average for water sports in the south east is applied. This is estimated at £14 per trip (NB: although £1 is reported for the fishing category, this is considered to be too low for this site as most of the angling is by boat). The estimates of the benefits, in terms of additional turnover, to charter boats from the additional number of trips are expected to range between £2,500 and £5,000 (considering displacement of visits).

5.5 Stage 5: Discounting and sensitivity analysis

5.5.1 Discounting

The following table depicts the value of the recreational and tourism benefits undiscounted. Most of the benefits for Folkestone Pomerania are related to recreational benefits to anglers.

Table 5-18: Tourism and Recreational benefits – UNDISCOUNTED benefits				
Site name	**Folkestone Pomerania**			
Regional project	**Balanced Seas**			
Recreational activity	**Tourism benefits and benefits to recreational users (travel costs only)**		**Tourism benefits and benefits to recreational users (TC plus other consumer surplus)**	
	Low	**Upper**	**Low**	**Upper**
Recreational diving	£2,000	£3,000	£2,000	£3,000
Recreational angling	£15,000	£31,000	£32,000	£57,000
Total	**£17,000**	**£34,000**	**£33,000**	**£60,000**

Discounting is undertaken based on the following assumptions:

1- Benefits to divers will arise in year 4, based on the recovery of blue mussel beds but with maximum benefits being achievable in year 8;
2- Benefits to anglers are not expected to be noticeable until year 8 and reach maximum benefits at year 15 from designation and implementation of management measures.

The discounted benefits are given in Table 5-19.

Table 5-19: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Folkestone Pomerania**	
Regional project	**Balanced Seas**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	Low	£205,000
	Upper	£371,000

5.5.2 Sensitivity analysis

The main uncertainty concerning the assessment of Folkestone Pomerania relates to the number of users benefiting from designation as well as the number of participants under the baseline. Consultation undertaken for this study has revealed that there are in the region of 70 diving clubs within Kent, and the Brazen (one of the wrecks lying within the Folkestone Pomerania rMCZ) in particular is a very popular site, (the area is relatively shallow and far enough out for reasonable visibility). Although the estimates of 210 divers appear to be reasonable, there are quite possibly divers visiting the site from beyond Kent. As a result the first sensitivity test includes provision for a greater number of divers benefiting from designation.

Changes in number of recreational divers

Assuming a larger number of divers at the site of 300, which represents an increase of 40% in the number of users and assuming the same frequency of visitation and scale of impacts, could increase the recreational benefits by around 4% which is not insignificant. Further validation may be required on the number of diving visits per year.

Table 5-20: Sensitivity test 1: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Folkestone Pomerania**	
Regional project	**Balanced Seas**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	Low	£212,000
	Upper	£386,000

Exclusion of consumer surplus

Exclusion of consumer surplus will also have a significant impact on the level of recreational impacts; mainly due to the recreational benefits arising to sea anglers. Consultation undertaken for this study has suggested that anglers are often disappointed by the lack of the favourite species of fish they used to catch but rarely catch now -so improvement in the health of the area to support greater fish populations is likely to increase the area's popularity for angling. Absence of physical seabed disturbance from towed gear, and consolidation of large areas of sediment seabed with more extensive *Sabellaria* reefs could help decrease local turbidity, and increase the richness of attached seabed communities (sponges, anemones, bryozoans and hydroids etc.) and mobile wildlife (fish, molluscs, crustaceans) which would increase the popularity and variety of dive sites. Most diving off Dover is on wrecks, but the Folkestone Pomerania contains natural sandstone reefs which could increase in popularity. As a result, it is suggested that consumer surplus is retained for the main

assessment but bearing in mind that its exclusion could reduce the benefits from designation significantly.

Table 5-21: Sensitivity test 2: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Folkestone Pomerania**	
Regional project	**Balanced Seas**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users (revealed preference approach only)	Low	£109,000
	Upper	£218,000

6 Cumbria Coast

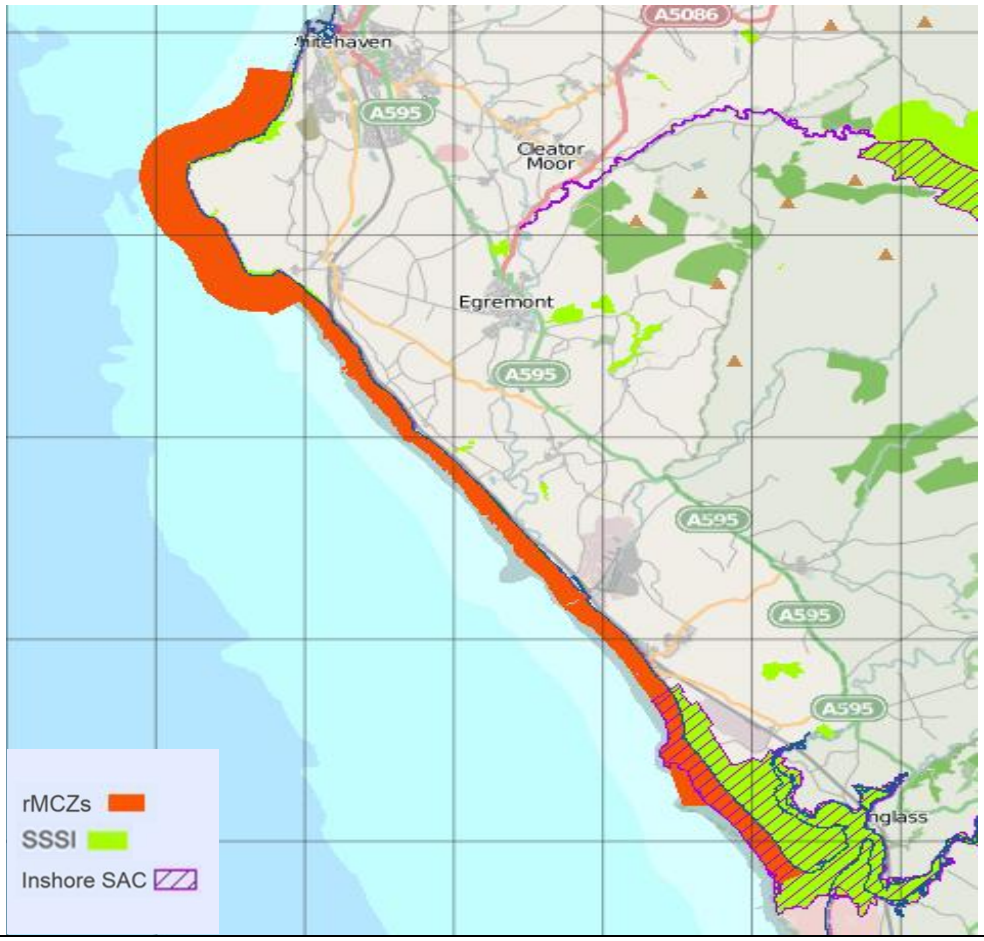
6.1 Stage 1: Baseline definition

The Cumbria Coast rMCZ is a predominantly intertidal area within the eastern Irish Sea; the rMCZ stretches from just north of St. Bees head down to the River Esk estuary in Ravengass. The Cumbria Coast overlaps two SSSIs, one SAC and incorporates an RSPB nature reserve. The area has been recommended to protect and preserve various marine habitats, such as: biogenic reefs, blue mussel *Mytilus edulis* beds and honeycomb worm *Sabellaria alveolata* reefs.

A proportion of the rMCZ around St. Bees head extends beyond the low water mark to incorporate the feeding and loafing grounds of the black guillemot *Cepphus grille* which will complement the only known English breeding ground for this bird. The site will also support other species within the RSPB site, including the: razorbill *Alca torda*, kittiwake *Rissa tridactyla* and fulmar *Fulmarus glacialis*.

Table 6-1 set out basic information for Cumbria Coast.

Table 6-1:	Basic information about rMCZ	
Site name	**Cumbria Coast**	
Regional project	**Irish Sea Conservation Zones Regional Project**	
Area	17 km^2	
Type of site	Inshore/coastal	
Overlaps with existing MPA (SPAs, SACs, SSSIs, RAMSAR sites)	International Designations	
	Current Inshore SAC	Parts of the site overlaps the Drigg Coast SAC
	National Designations	
	SSSI	The Cumbria Coast rMCZ overlaps St Bees Head and Drigg Coast SSSI



Source
MMO marine planning portal DEFRA (2012)

6.1.1 Step 1.1: Define recreational uses and tourism activities

Trips to the Cumbria Coast are made by both domestic and non-domestic visitors to partake in numerous recreational activities. The rMCZ includes several beaches: St. Bees, Coulderton, Nethertown, Bryastones, Sellafield, Seascale, Drigg and part of Ravenglass.

Seascale and St. Bees have been awarded the Quality Beaches Award by Keep Britain Tidy in 2012; this has contributed towards the popularity of these beaches and made them family day trip resorts[42]. There are several caravan sites situated along the coastline, serving both visitors and permanent residents.

St. Bees Head is the site of an RSPB bird reserve; this is the only breeding place for black guillemots in England. The site also provides breeding and loafing grounds for razorbill *Alca torda*, kittiwake *Rissa tridactyla* and fulmar *Fulmarus glacialis*. This makes it a popular site with wildlife enthusiasts and bird watchers.

[42] http://www.dayoutwiththekids.co.uk/family-fun/St_Bees_Beach/3922

The coast to coast long distance walking path starts/ends at St. Bees head, this has been estimated to attract up to 12,000 people each year. A survey on beach occupancy by Cefas (2010) stated the beaches within the rMCZ were used by walkers and dog walkers.

The Cefas report also stated that the majority of the beaches within this area are popular with recreational anglers, with some of the key target species being cod, rockling and bass.

RYA sailing clubs are situated just north and south of the Cumbria Coast rMCZ, and are thought to utilise the RYA cruising route that passes through the northern part of the rMCZ designation boundary.

The following table shows the activities for Cumbria Coast based on the MMO marine planning portal, internet searches and the Cefas Radiological Habits Survey: Cumbrian coast beach occupancy, 2009 (2010) , as completed in the spreadsheet.

Table 6-2: Level of activities at the site		
Site name	**Cumbria Coast**	
Regional project	**Irish Sea Conservation Zones Regional Project**	
Recreation categories	**Activity**	**Current level of use**
Informal recreation	Walking/hiking *	Very high use
	Bathing/swimming**, picnicking, sand-castle building	High use
Wildlife observation	Wildlife watching - bird watching	Very high use
	Wildlife watching - cetacean watching	Low use
Water sports	Recreational angling	High use
	Board sports (windsurfing, surfing and kite boarding)	Low use
	Paddle sports (kayaking, paddle boarding, canoeing, rowing)	Low use
	Sailing	Moderate use
Other formal recreation along the coast	Harvesting from the foreshore (bait collecting and intertidal gathering)	High use
	Sand yachting	Low use
	Rock-pooling	High use

Notes:

*Walking along the coast has been assumed to incorporate both walkers and dog walkers

** Bathing and swimming was assumed to be lower than other informal receation due to the presence of Sellafield nuclear power station within the rMCZ and the lack of reference to swimming within the site when compared to other informal recreation

Sources:

Current levels of use has been determined from data sourced from:
http://planningportal.marinemanagement.org.uk/

Cefas Radiological Habits Survey: Cumbrian coast beach occupancy, 2009 (2010)
http://www.cefas.defra.gov.uk/publications/environment/Cumbrian-coast-beach-occupancy-report-2009.pdf

In addition, information on other important site characteristics is recorded as follows.

Table 6-3: Attributes affecting visitor numbers at Cumbria coast		
Site name	**Cumbria Coast**	
Regional project	**Irish Sea Conservation Zones Regional Project**	
Attributes	**Score**	**Description**
Facilities	Moderate	There are shops and facilities for the conduct of specific activities but they do not operate throughout the whole year.
Access to the site (travel opportunities)	Moderate	There are public transport connections and people travel by private transport (car park facilities are available).
Awareness of the site	Moderate	The site attracts visitors from the region and slightly further away.

Table 6-4 sets out the types of facilities supporting the different recreational activities found within the area.

Table 6-4: Baseline facilities		
Site name	**Cumbria Coast**	
Regional project	**Irish Sea Conservation Zones Regional Project**	
Facilities	**Number**	**Additional description on activity and source of information**
Angling and sport fishing centres	0	Shore-based fishing occurs along the whole length of the rMCZ with species targeted being: Cod, Coalfish, Dab, Rockling, Plaice, Eels, Wrasse, Pollack, Bass Dogfish and Mackerel However there do not appear to be any fishing centres or clubs within this area.
Bird reserves and sanctuaries	1	St Bees RSPB reserve has three viewing platforms from which guillemots, kittiwakes, fulmars and razorbills can be seen. The birds are also often viewed by paddlers passing around St Bees. http://www.rspb.org.uk/reserves/guide/s/stbeeshead/about.aspx
Picnic areas	1	One picnic area is located on the StakMap and OS maps.
Sightseeing and visitors centres	0?	No visitor centres are located near to the beaches or rMCZ There was a visitor centre at Sellafield, but this has now been closed to the public.
Caravanning sites	6 near the shore	Caravan sites are dotted along the coast and are popular with holiday makers and residents.
Blue Flag beaches	0	None of the beaches within the rMCZ have been awarded Blue Flags, however St Bees and Seascale have been awarded a Quality Coast Award by Keep Britain Tidy http://www.keepbritaintidy.org/ImgLibrary/Award%20Winners%202012_3643.pdf
RYA clubs	0?	There are two RYA clubs just outside of the rMCZ at Whitehaven and Ravenglass. It is assumed that both of these will incorporate the Cumbria Coast in their sailing paths.
RYA Marinas	0?	There is one Marina just outside of the rMCZ at Whitehaven.
RYA Training centres	0?	There is one RYA training centre just outside of the rMCZ, Cumbria powerboat training centre.

The different facilities are depicted in the following figure.

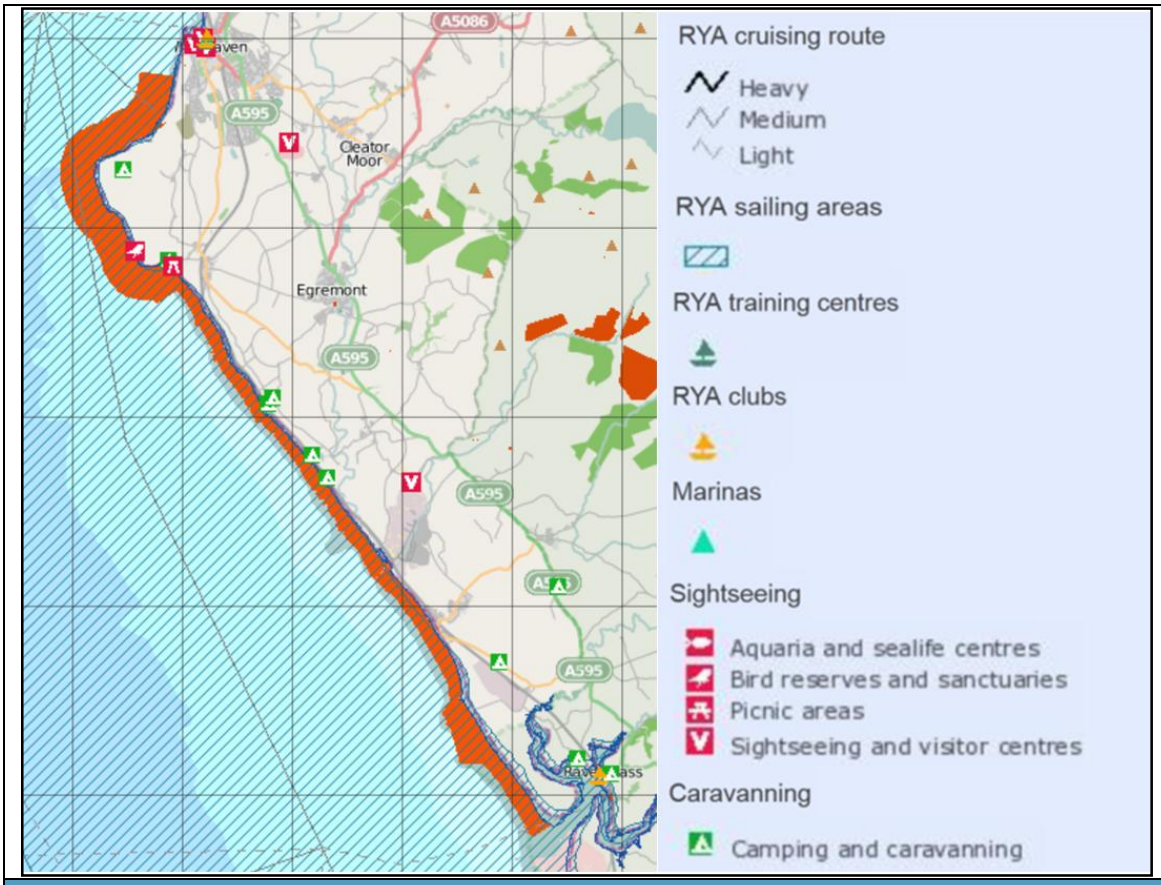


Figure 6-1: Facilities at Cumbria Coast for conducting recreational activities
Source: MMO marine planning portal

6.1.2 Step 1.2: Define conflicts among users

Table 6-5 shows the assessment of impacts from non-recreational uses on recreation and tourism.

Table 6-5: Non-recreational uses and Interactions with recreational uses		
Site name	**Cumbria Coast**	
Regional project	**Irish Sea Conservation Zones Regional Project**	
Non-recreational uses	**Brief description**	**Impact on recreational uses?**
Energy	The need for a new marine landing facility at the new nuclear power station at Sellafield was identified in 2011 but it is not anticipated for at least 5 years.	This could impact the benefits to recreational uses negatively
Commercial fisheries	Approximately 700 vessels are known to be active in the Irish Sea Conservation Zone and 15 are known to fish in this site although probably not this close to shore. A number of commercial fishing restrictions are already in existence.	Due to existing restriction no conflicts are expected
Ports, harbours and shipping	There are two disposal sites, associated with the port of Whitehaven.	No conflicts reported. No port developments are known to be planned within the next 20 years.

No conflicts among recreational uses are known.

6.1.3 Summary of recreational and tourism value under baseline

Table 6-6 below shows the type of activities and level of recreational use under each.

Table 6-6: Summary of activities and level of use	
Site name	**Cumbria Coast**
Regional project	**Irish Sea Conservation Zones Regional Project**
Level of use	**Recreational activity**
Low use	Wildlife watching - Cetacean watching; Board sports; Sand yachting;
Moderate use	Sailing; Paddle sports;
High use	General beach use; Rock-pooling; Recreational Angling; Harvesting from the foreshore;
Very high use	Walking/hiking; Wildlife watching - Bird watching

Cumbria Coast is a type 2 site, i.e. a site which is actively used for tourism and recreation but not considered to be a honeypot. However, figures have revealed that the site is highly popular among informal recreational users. Indeed:

"West Cumbria has many of the scenic wonders of the central Lake District but without the crowds at the tourist "honey-pots"43"

Figures from MENE on informal recreation are replicated below (these are estimates for different coordinates). On the other hand, more formal recreation is not high in numbers (as revealed by StakMap).

Table 6-7: Informal recreation along Cumbria coast for 2011/2012	
VISIT_Gaztown	**Number of visits (thousands)**
Whitehaven	26.84
St Bees	27.71
Whitehaven	30.79
St Bees	40.87
St Bees	65.93
Total	192.14

6.2 Stage 2: Screening the impacts from designation and management on recreation and tourism

6.2.1 Step 2.1: Impacts on recreation and tourism from changes in the environment

Task 1: Identifying changes in the environment

The honeycomb worm reefs are reported to be amongst the most extensive and best examples in the UK and provide valuable habitat for other marine species. Other habitats included within the rMCZ are: peat and clay exposures (irreplaceable habitat type), cobble and boulder scars, and high energy intertidal rock. These provide habitats for species such as: bladder wrack *Fucus vesiculosus*, piddocks (*Pholas dactylus*, *Barnea candida* and *Barnea parva)* and starfish.

Table 6-8 summarises the findings for Cumbria Coast, based on information from the impact assessment.

[43] Quote extracted from http://www.cumbriancoastline.co.uk/?Cumbrian_Coast:The_Cultural_Coast

Table 6-8: Changes in conservation status					
Site name	**Cumbria Coast**				
Regional project	**Irish Sea Conservation Zones Regional Project**				
Feature	**Area of Feature km^2**	**No. Of Point Records**	**Condition without designation (baseline)**	**Conservation objective**	**Additional notes, time for recovery, impacts off-site**
Broad-scale Habitats					
Intertidal Sand and Muddy Sand	5.01	-	Unfavourable condition	Recover to favourable condition	2 to 5 years?[44]
High Energy Infralittoral Rock	0.40	-	Unfavourable condition	Recover to favourable condition	Habitat for kelp, mussels and barnacles. As these are slower moving (longer time assumed to establish and reattach) species, it is assumed that recovery time will be medium to long (20 to 50 years)
Habitats of Conservation Importance					
Honeycomb Worm Reefs	0.61	11	Unfavourable condition	Recover to favourable condition	Average life span of a Honeycomb worm is between 3 and 9 years[45]. Based on this it is assumed that recovery will be between 5 and 20 years (assuming that there is a small community of worms present).

44 http://books.google.co.uk/books?id=QoGfZm82XGQC&pg=PA128&lpg=PA128&dq=Intertidal+Sand+and+Muddy+Sand+recovery+time&source=bl&ots=_n7jXBMv1j&sig=lQQZKyAO8_PLFI7Xi74ys_78E2o&hl=en&sa=X&ei=MrasUY_CN-nW7Qbyw4CYCA&ved=0CDsQ6AEwAg#v=onepage&q=Intertidal%20Sand%20and%20Muddy%20Sand%20recovery%20time&f=false Ecology of Marine Sediments: From Science to Management, page 128

45 http://www.wildlifeincumbria.org.uk/uploads/resources/Honeycomb%20Worm%20Reefs%20AP.pdf The Cumbrian Biodiversity Action Plan

Task 2: Identification of recreational uses under baseline benefiting from changes in environmental quality

Table 6-9 links the features with the specific recreational uses, as given in the Table 6-8 (above). As designation is expected to protect habitats and features supporting species with recreational values, positive impacts might be expected.

Table 6-9: Recreational uses benefiting from improvement in feature conservation status				
Site name	**Cumbria Coast**			
Regional project	**Irish Sea Conservation Zones Regional Project**			
Feature/habitat	**Conservation objective**	**Supported species with recreational value**	**Other (Time for recovery and impacts off-site MCZs)**	**Recreational use under baseline**
Intertidal Sand and Muddy Sand	Recover to Favourable Condition	Shore birds and some wildfowl during low water period and diving ducks and fish	As given in Table 6-8	Angling Bait collecting Nature watching (bird watching and cetacean watching)
High Energy Infralittoral Rock	Recover to Favourable Condition	Lobster and crab	As given in Table 6-8	Angling
Honeycomb Worm Reefs	Recover to Favourable Condition	Provides a habitat for other shore-dwelling animals and seaweeds, such as snails and shore crabs	As given in Table 6-8	Angling? Rook-pooling?

6.2.2 Step 2.2: Impacts from management on recreational activities and tourism

Task 1: Impacts from management strategies on recreational uses

Some information on management strategies has been gathered from the draft IA by Defra. The information is summarised in the following table.

Table 6-10: Impact of other management strategies on recreation and tourism			
Site name	**Cumbria Coast**		
Regional Project	**Irish Sea Conservation Zones Regional Project**		
Management strategy		**Provide further details**	**Describe impacts on specific habitats and recreational uses**
Closure of areas of High Energy Infralittoral Rock to pots and traps only. Closure of areas of biogenic reefs, Honeycomb Worm Reefs, peat and clay exposures and mussel beds to hand collection of shellfish. Gill netting and vessel speed managed out to 1 km offshore from St Bees' Head only. The required management has not yet been identified and is subject to further stakeholder discussion.		Different management scenarios have been proposed but the final management will fall between the two highlighted in the first column.	The closure of parts of the MCZ to bottom trawls, traps, nets, hooks and lines is likely to affect some recreational uses positively due to improvements in conservation status. There could be some impacts on anglers.
Closure of entire rMCZ to bottom trawls, dredges, hooks and lines, nets (including gill netting), pots and traps, and collection by hand.			

Task 2: Management of recreational activities

It is not assumed that there will be any management of recreational activities.

6.2.3 Step 2.3: Impact on recreation from improvements in services to visitors

Currently Cumbria Coast is not dotted with many facilities for visitors. Designation could increase the level of facilities. The Cumbria Coast is a Heritage Coast representing stretches of the most beautiful, undeveloped coastline, which are managed to conserve their natural beauty and, where appropriate, to improve accessibility for visitors. Currently there are no visitor centres.

The ecological and recreational benefits potentially provided by this rMCZ would complement Copeland Borough Council's coastal park programme. This aims to improve visitor facilities and experience of the marine environment while increasing visitor numbers, jobs and economic opportunity along the west Cumbrian coast. This will extend from Whitehaven to Millom.

6.2.4 Step 2.4: Impact on recreation from promotion

The Cumbria Coast is well known to informal recreational users and birdwatchers. There could be further promotion of the coast as a MCZ and further information could be provided in a visitor centre.

6.2.5 Step 2.5: Impact on tourism

There may be benefits from additional spend by informal recreational users and birdwatchers. The RSPB estimates that an additional 1,000 people visit St Bees Head each year because of its status as a nature reserve and to view the breeding sea bird colony on the cliffs. A charter boat offering wildlife-watching trips also visits the vicinity of St Bees Head (in Defra, 2012). This suggests that there are likely to be impacts as a result of designation.

Angling appears to be more popular further south but anglers could be attracted to the site following designation.

6.2.6 Summary of screening

The following table presents the result of the screening exercise for Cumbria Coast.

Table 6-11: Results of Impact screening				
Site name	**Cumbria Coast**			
Regional project	**Irish Sea Conservation Zones Regional Project**			
Designation leading to…	**Impact likely?**	**Recreational category affected**	**Tourism impacts?**	**Justification**
Conservation gains likely? (NB: habitats --> species with recreational value)	Yes	Anglers Wildlife watchers Rock-pooling	Yes	There will be benefits to habitats that support fish.
Improvement in relevant facilities likely? (NB: describe the type of facilities that may be improved or provided)	Yes	All	Yes	The ecological and recreational benefits potentially provided by this rMCZ would complement Copeland Borough Council's coastal park programme, which aims to improve visitor facilities and experience of the marine environment while increasing visitor numbers, jobs and economic opportunity along the west Cumbrian coast.
Promotion likely	Yes	All	Yes	There may be additional promotion following visitor centre and maybe internet advertising.
Other (e.g. through management activities and/or reduction in conflict?)	Yes	Anglers Wildlife watchers	Yes	The closure of parts of the MCZs or even the whole of the MCZ to bottom trawls, traps, nets, hooks and lines is likely to affect some recreational uses positively due to improvements in conservation status but these are captured above. There are no reported conflicts at the site.

6.3 Stage 3: Impact evaluation from designation and management on recreation

6.3.1 Step 3.1: Assessing the impacts on existing users

Step 3.1.1: Qualitative assessment of impacts

Table 6-12 presents the results of the analysis for the Cumbria Coast in qualitative terms.

Table 6-12: Qualitative assessment of impacts on existing users			
Site name	**Cumbria Coast**		
Regional project	**Irish Sea Conservation Zones Regional Project**		
Existing recreational activity	**Level of impacts on quality of the experience**	**Reasoning**	**Confidence assessment**
Walking/hiking	Moderate	Current visitors already enjoy the natural beauty of the landscape and the site has a number of designations so it is perceived to be of good quality. It could be perceived better if it was designated, and the quality of experience improved if more services were provided.	Moderate
General beach use - bathing/swimming, picnicking, sand-castle building			
Wildlife watching - bird watching	Moderate/significant	There could be benefits to birdwatchers from improvements in the colonies of birds.	Moderate
Wildlife watching - cetacean watching	Small/moderate	There could be benefits but these are linked to promotion and improvement of services	Moderate
Recreational angling	Moderate/significant	The impacts in terms of conservation could be moderate to significant.	Moderate
Board sports (windsurfing, surfing and kite boarding)	Small/moderate	There could be benefits in terms of perception following designation.	Low
Paddle sports (kayaking, paddle boarding, canoeing, rowing)	Small/moderate		Low
Sailing	Small/moderate		Low
Rock-pooling	Moderate	Due to conservation gains.	Moderate

Step 3.1.2: Estimating the additional number of visits by existing users

The following table sets out the number of users for the different recreational categories under the baseline. This information is based on StakMap data.

Table 6-13: Estimating number of users affected				
Site name	**Cumbria Coast**			
Regional Project	**Irish Sea Conservation Zones Regional Project**			
Existing recreational activity	**Level of impacts**	**Number of current users**	**Source of data**	**Level of confidence**
Walking/hiking General beach use	Moderate	11,000 users	DEFRA (2012)	Moderate. The figure is based on Defra (2012) which estimates 10,000 to 12,000 people annually
Wildlife watching - Bird watching	Moderate	1,500	Defra (2012, based on estimates from RSPB)	Moderate StakMap data for this is too low, as a result an estimate of 1,500 has been used (the average of figures from RSPB noting that there are between 1,000 to 2,000 visitors, in Defra, 2012).
Recreational Angling	Moderate	36	Cefas (2010[46])	Low StakMap data appears to be low (3.56 anglers per year). Communication regarding the validation of data revealed that the figures were likely to underestimate the angling clubs by 45% and anglers by at least 22%. As a result, Cefas report's data on head counts has been used instead.
Rock-pooling	Moderate	113	Cefas (2010)	Low/moderate Cefas (2010) estimates a total of 113 hrs per year. Assuming that the average user spend an hour this will be equivalent to 113 users.

Based on the information presented above, assumptions on the increase in frequency of visits due to conservation gains and promotion can be made. However these assumptions mean that the confidence levels are low for general beach use and recreational angling. Results are presented in Table 6-14. The impacts of designation on visitor numbers are expected to be medium, therefore a maximum increase of 10% in the number of visits has been assumed.

[46] Cefas (2010) Radiological Habits Survey: Cumbrian coast beach occupancy, 2009, a report for the Environment Agency.

Table 6-14: Assessing additional visits per year							
Site name	**Cumbria Coast**						
Regional project	**Irish Sea Conservation Zones Regional Project**						
Existing recreational activity	**Number of current users**	**Average number of trips per year under baseline**	**Additional number of trips per user**		**Additional number of trips per year (increase in average x number of users affected from changes)**		**Confidence assessment**
			Low	**Upper**	**Low**	**Upper**	
Walking/hiking	11,000	N/A	N/A	N/A	550	1100	Medium – Assumes an increase of 5-10%. Average participations for England from Watersport Survey (same average number of trips assumed for bird watchers as for informal recreational users).
Wildlife watching - bird watching	1,500	N/A	N/A	N/A	75	150	
Rock-pooling	113	13.2	1.32	3.96	75	149	
Recreational angling	36	13.4	1.34	4.02	15	30	

Step 3.1.3: Monetary valuation of benefits to existing users

Task 1: Travel costs based approach

Existing users will incur a travel cost for additional visits conducted to the site. The costs based on the assumptions above are calculated in Table 6-15. These are assumed to represent the recreational benefits to existing users from increased visitation related spend.

Table 6-15: Assessing recreational benefits per year				
Name of site	**Cumbria Coast**			
Regional project	**Irish Sea Conservation Zones Regional Project**			
Recreational activity	**Average travel and parking spend (£ per trip)**	**Additional benefits to recreational users- revealed preference approach**		**Confidence assessment**
		Lower	**Upper**	
Walking/hiking general beach use - bathing/swimming, picnicking, sand-castle building	4.38*	£2,400	£4,800	Low/moderate: travel costs based on a sample of 19 people. May underestimate benefits to birdwatchers and anglers (as they may travel longer distances)
Wildlife watching - bird watching	4.38*	£300	£700	
Rock-pooling	4.38*	£300	£700	
Recreational angling	4.38*	£100	£100	
Notes: *The cost for general beach use has been used, as similar facilities regarding travel and parking are likely to be available to the groups. This is the average spend for Copeland, based on MENE survey data. Source: Natural England: Monitor of Engagement with the Natural Environment (MENE) (data for 2011/2012)				

Task 2: Extended approach (applying consumer surplus for specific recreational categories)

The only estimates available for the above categories for consumer surplus are for recreational angling and informal recreation.

Recreational angling

In order to exercise caution the value of £73.2[47] is applied to the additional number of trips (majority of activity is shore based). The benefits are estimated to range from £1,000 (low estimate) to £2,000 (high estimate).

When changes in conservation status are expected to impact the diversity of species and the size of catch, additional values could apply to account for the change in conservation value. The value taken here is £1.10 per trip applied across all trips (based on a moderate improvement, increase in size of 5%). The benefits are thus estimated at around £350 and considered to be negligible.

[47] 68.96+8.62-4.38

Informal recreation

In order to exercise caution the value of £13.83 is applied to the additional number of trips as the site offers good recreational opportunities, e.g. long beach with coastal trail, bathing/swimming, rock-pooling. However there are alternative sites in the form of Whitehaven and Silecroft. The benefits are estimated to range from £8,000 (low estimate) to £15,000 (high estimate).

Task 3: Adjustment for displaced visits

It is possible that these values refer only to a transfer of visits instead of new visits. This is expected to be more the case for specific recreational categories such as angling and bird watching. Assuming a 40% displacement (low to moderate displacement) for these impact categories will reduce the recreational benefits. The new benefits are set out in Table 6-16.

6.3.2 Step 3.2: Estimating the impacts to new users

Due to the presence of alternative sites nearby it is likely that many new users to the rMCZ site of Cumbria Coast will be transfers from others sites. Genuine new users from elsewhere are also likely but they will not contribute a significant number of visits.

6.3.3 Step 3.3: Summary of impacts

The recreational benefits for the Cumbria Coast rMCZ are summarised in the table. They are expected to range between £12k and £23k.

Table 6-16: Assessing recreational benefits to existing users				
Site name	**Cumbria Coast**			
Regional project	**Irish Sea Conservation Zones Regional Project**			
Recreational category	**Recreational benefits**		**Confidence**	**Summary of assumptions/method**
	Low	**High**		
Informal recreation	£2,400	£4,800	Low	Travel costs based approach (average for Copeland, based on MENE). Assumes increases in frequency of 10-30%
	£8,000	£15,000	Low	Extended approach applying consumer surplus to additional trips
Wildlife watching - bird watching	£200	£400	Low	Travel costs based approach (assumes same costs as informal recreation)
Rock-pooling	£300	£700	Low	Travel costs based approach (assumes same costs as informal recreation)
Recreational angling	£0	£100	Low	Travel costs based approach
	£1,000	£2,000	Low	Extended approach applying

Table 6-16: Assessing recreational benefits to existing users				
Site name	**Cumbria Coast**			
Regional project	**Irish Sea Conservation Zones Regional Project**			
Recreational	**Recreational benefits**		**Confidence**	**Summary of assumptions/method**
				consumer surplus for additional trips
	£350	£350	Low	Changes in conservation status applied across all trips
Total	**£12,000**	**£23,000**	Low	Estimates of travel costs are believed to be low. Similarly the number of anglers is believed to be low

6.4 Stage 4: Impacts evaluation from designation and management on tourism

6.4.1 Step 4.1: Qualitative assessment of impacts

Table 6-17 presents the qualitative evaluation for the tourism sector for the rMCZ area of Cumbria Coast. The main benefits are to accrue to the catering sector; this is assumed to be in the form of local shops and cafes.

Table 6-17: Qualitative assessment of tourism impacts			
Site name	**Cumbria Coast**		
Regional Project	**Irish Sea Conservation Zones Regional Project**		
Business affected/recreational uses	**Level of impacts due to new visits**	**Confidence assessment**	**Justification.**
Catering sector	Moderate	Moderate	Impacts from the additional visits across all users.

6.4.2 Step 4.2: Quantitative assessment of impacts

StakMap data does not report any charter boats for recreational angling.

Benefits will accrue more generally to shops.

6.4.3 Step 4.3: Monetary assessment of impacts

The tourism benefits are summarised in Table 6-18.

Table 6-18: Tourism benefits				
Site name	**Cumbria Coast**			
Regional project	**Irish Sea Conservation Zones Regional Project**			
Recreational category	**Average of spend on other items**	**Additional revenue to the tourism industry**		**Confidence assessment**
		Lower estimate	**Upper estimate**	
Informal recreation	3	£1,700	£3,300	Low – the average spend appears to be low.
Bird watching	3	£100	£300	Low- there is no data available for bird watching; this could be because people would take their own drinks and food; however it is assumed that a proportion would use local facilities such as cafes. As a result the same spend as for informal recreation applies.
Rock-pooling	3	£200	£400	Low- number of users and average spend appears to be low
Recreational angling	6	£100	£100	Low – the average spend is taken from methodology but assumed to have moderate confidence as it appears low (assuming a proportion of anglers would bring their own supplies and others would buy at the site).
Total		**£2,100**	**£4,100**	

No data on costs for Cumbria Coast is available from the MENE data. As a result, the average for informal recreation and fishing in the north west was applied.

6.5 Stage 5: Discounting and sensitivity analysis

6.5.1 Discounting

The following table depicts the value of the recreational and tourism benefits undiscounted. Most of the benefits for Cumbria Coast are related to informal recreation but estimated benefits are probably under valuing the benefits from designation.

Table 6-19: Tourism and Recreational benefits – UNDISCOUNTED benefits				
Site name	**Cumbria Coast**			
Regional project	**Irish Sea Conservation Zones Regional Project**			
Recreational activity	**Tourism benefits and benefits to recreational users (travel costs only)**		**Tourism benefits and benefits to recreational users (travel costs + other consumer surplus)**	
	Low	**Upper**	**Low**	**Upper**
Informal recreation	£4,000	£8,000	£12,000	£23,000
Wildlife watching - bird watching	£0	£1,000	£0	£1,000
Rock-pooling	£1,000	£1,000	£1,000	£1,000
Recreational angling	£0	£0	£1,000	£2,000
Total	**£5,000**	**£10,000**	**£14,000**	**£27,000**

Discounting is undertaken based on the following assumptions:

1- Informal recreational benefits are assumed to start in year 3 following promotion and improvements of facilities and maximum benefits are expected to arise in year 6;
2- Benefits to wildlife watchers, anglers and rock-pooling are not expected to be noticeable until year 8 and reach maximum benefits at year 15 from designation and implementation of management measures.

The discounted benefits are given in Table 6-20.

Table 6-20: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Cumbria Coast**	
Regional project	**Irish Sea Conservation Zones Regional Project**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	**Low**	£145,000
	Upper	£288,000

6.5.2 Sensitivity analysis

The level of confidence concerning participation rates in the Cumbria Coast rMCZ is moderate except for recreational angling. Communication undertaken for this study has revealed that the figures for the north west are reported to underestimate the angling clubs by around 45% and the number of anglers by around 22%. However, applying these increases to the number of figures reported by StakMap would still provide lower estimates that those given in the Cefas report. As a result, the

figure of 36 reported in the main assessment is believed to provide a good proxy for the number of anglers. Angling is believed to be more popular on the southern part of this coast. The main sensitivity test thus concerns the exclusion of consumer surplus.

Exclusion of consumer surplus

The following table sets out the discounted benefits assuming no increased in consumer surplus from increased visitation. The benefits reduce significantly which shows the high sensitivity of the estimates to the inclusion of consumer surplus derived from designation.

Table 6-21: Sensitivity test 1: Tourism and Recreational benefits – DISCOUNTED benefits		
Site name	**Cumbria Coast**	
Regional project	**Irish Sea Conservation Zones Regional Project**	
Total Benefits in Year (Present Value) rounded to nearest thousand		
Tourism benefits and benefits to recreational users	**Low**	£52,000
	Upper	£104,000

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Risk & Policy Analysts Limited
Farthing Green House, 1 Beccles Road
Loddon, Norfolk, NR14 6LT, United Kingdom

Tel: +44 1508 528465
Fax: +44 1508 520758
E-mail: post@rpaltd.co.uk
Website: http://www.rpaltd.co.uk