

Science Advisory Panel Assessment of the Marine Conservation Zone Regional Projects Final Recommendations

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Part A

1. Introduction

- 1.1. This report (part A) provides an independent assessment by the Science Advisory Panel (SAP) of the extent to which the final recommendations¹ of the Marine Conservation Zone (MCZ) Regional Projects meet the requirements of the Ecological Network Guidance (ENG) for an ecologically coherent network. An accompanying report (part B), in the form of a spreadsheet and commentary, provides an assessment of the evidence used to support the recommended MCZs and draft conservation objectives.

- 1.2. Part A consists of:
 - 1 An Executive Summary.
 - 2 - 6 Assessments of the individual sets of recommendations provided by the Regional Stakeholder Groups (RSGs) of the four Regional Projects (RPs) against the design principles of the ENG.
 - 7 General comments on a number of specific issues that arise from the assessments.
 - 8 Conclusions and recommendations.
 - 9 References

Annex 1. The protocol for the development of the MPA SAP's advice to Defra on the Regional Projects' Final Recommendations for MCZ Networks

- 1.3 Part B is a substantial piece of 'work in progress' carried out in a very short period of time. It consists of a description of the work done together with a summary of the results, initial conclusions and explanatory comments.

2. Executive Summary

- 2.1. We report by identifying deficiencies, omissions, uncertainties and risks so the overall tone of this assessment is inevitably negative. We

¹ In considering the recommendations of all the Regional Projects with regard to whether the ENG design principles have been met, we have taken the calculations and tables provided at face value; we are not in the position to re-examine all the underlying calculations.

recognise that this does not provide a balanced commentary on the huge amount of skilful, constructive work that has gone into preparing these recommendations and express our huge admiration for the efforts of all concerned. We are optimistic that the work undertaken by the Regional Stakeholder Groups (RSGs) provides a strong basis from which an ecologically coherent network of Marine Protected Areas (MPAs) can be delivered in the waters under the jurisdiction of Secretary of State.

- 2.2. The ENG contains practical guidelines to identify and protect MCZs that will contribute to an ecologically coherent MPA network and fits within the framework of existing government policy and legislation. It is based on best science available at the time and was subject to extensive review before it was issued for use by the RSGs. Practical implementation of the ENG requires reliable data and the Statutory Nature Conservation Bodies (SNCBs) and Defra have committed significant resources to the provision of best available evidence which has been augmented by stakeholders. Practical implementation of the ENG has raised some problems which have required a degree of simplification. We have provided scientific advice throughout to assist the RSGs in their interpretation of the ENG and we are content that, if the recommended network of MCZs is implemented in full, ecological coherence can be achieved. However, deficiencies and uncertainties exist that carry risks and these need to be addressed before the Final Recommendations go out to Consultation. Furthermore, each Regional Project has retained its own character such that there are discrepancies in the approach implemented by them.
- 2.3. The majority of targets that were set to achieve an ecologically coherent network of MPAs have been met. The main deficiencies arise from:
 - 2.3.1. Doubts about the robustness of the sources of data cited as evidence in the individual Recommended Marine Conservation Zone (rMCZ) and Recommended Reference Area (rRA) descriptions provided by the four Regional Projects. These are described and discussed in part B, and recommendations for action are provided.
 - 2.3.2. Net Gain and Irish Sea Conservation Zones (ISCZ) recommendations which do not protect even the recommended minimum proportion of

the broadscale habitat subtidal mud (A5.3) within their regions. The ISCZ RSG proposes a co-location zone to the south of rMCZ2 West of Walney. If this is taken up and studies confirm that the subtidal mud habitat has/will not be significantly altered by hydrodynamic changes produced by the wind farm pylons, then the shortfall could be made up. Nevertheless, the proportions of mud remain insufficient at present and further negotiations with stakeholders are recommended. The Net Gain RSG offers no agreed solution to make good the deficit. Further negotiations with their stakeholders are recommended.

- 2.3.3. Minimalist rRAs, together with more general uncertainties over Conservation Objectives, carry the risk that the rMCZs and rRAs will fail to deliver the levels of protection that are required to mitigate damaging pressures and facilitate recovery of habitats and species. The SNCBs and organisations responsible for management measures will need to resolve the uncertainties over Conservation Objectives but a SNCB/Defra led initiative is recommended to resolve the deficiencies in the RA network. Such an initiative might include a more quantitative assessment of the likely current status of the rMCZs and rRAs.
- 2.3.4. 'Maintain' and 'Recover' management objectives are simplistic and the words used do not convey what is meant. In particular, "Recover" often means remove any damaging activities and maintain at whatever habitat and community of species remains or develops. "Recover" suggests that the site has been damaged (which may not be true) and that there is some pre-existing state to recover to (which may not be the case, or may not be possible). The assumption that removal of an anthropogenic pressure will return a feature to some pre-existing 'good status' is inaccurate and likely to raise false expectations. Although a footnote in the Conservation Objective Guidance (COG) states that 'Recovery does not necessarily mean returning to former state', the term is regularly used to mean 'to restore attributes listed in Conservation Objectives'. There are specific queries on whether the appropriate Conservation Objectives have been identified that need to be addressed. The greatest concern to the SAP is that by definition any objective of 'to recover' means that a site is being judged against (and aims to be restored to) a reference condition. The latter is either

what the site was like before human interference (a temporal control) or what it is like compared to a similar, unaffected site (spatial control). We emphasise that unless such a reference is determined then marine environmental managers will have no way of determining if and when the Conservation Objective is met. Much greater clarity is required in relation to definitions such that realistic and achievable conservation objectives can be defined. Without such an approach it will be impossible to assess the benefits (or negative impacts) of the implemented network.

2.3.5. There remain gaps in both adequate coverage of ENG features and information on the site characteristics that might mean re-engaging with stakeholders. The identification of locations for protection has relied greatly on socio-economic considerations with biodiversity often of secondary consideration or taken account of late in the process. We acknowledge that this is a consequence of the stakeholder-led process, the initial premise of the whole project. The value and 'special features' of each rMCZ and rRA are not always clearly stated in the site descriptions and that can be greatly improved for many. Such clarity, where survey data is adequate, is essential in developing detailed Conservation Objectives for a site.

2.4. Removal of the most harmful pressures within MCZs should be a primary goal. At present there are rMCZs where damaging practices may occur yet Conservation Objectives are set to 'maintain'. As work continues on the draft Conservation Objectives, we recommend that 'maintain' is only used where best available evidence can be provided in the site descriptions to demonstrate that the level of permitted activities taking place at the rMCZ are not likely to affect favourable conservation status of the habitats and species and other features. In the absence of such information, the precautionary principle should apply, and harmful pressures be removed. However, we also caution that this approach relies on the presumption that an activity causes a pressure which causes an unacceptable adverse impact. This is not always the case. We further take the view that relying uncritically on that assumption could lead to challenges by stakeholders.

3. Assessment of the Finding Sanctuary Final Recommendations

3.1 Overview

- 3.1.1. The combination of MPAs and network of rMCZs, designated in its entirety, would meet the majority of the Ecological Network Guidance criteria for an ecologically-coherent network.
- 3.1.2. However, many broadscale habitats (BSH) and Features of Conservation Importance (FOCI) do not have Reference Areas identified or the RAs identified are very small and therefore do not meet viability criteria. We consider that the identification of RAs fails to meet the requirement of the ENG and coupled with doubts over the consistency of Conservation Objectives (COs) leads to concern that levels of protection will be inadequate. We comment further on this in section 7.4.
- 3.1.3. Finding Sanctuary has adjusted boundaries to take account of areas of identified high biodiversity although we observe that there are significant areas of seabed where no such assessment is possible because of a lack of data.
- 3.1.4. We note that some of the highest ranking sites for biodiversity, or special features, have not come forward as recommended Reference Areas.
- 3.1.5. We note that most offshore rMCZs are predominantly at the outer borders of the region. The rationale for this, in terms of the various socio-economic pressures that have been accommodated, has not been provided.

3.2. Detailed comments – Achievement of the ENG design principles

- 3.2.1. **Representativity:** The ENG targets for representativity have been met for all broadscale habitats and FOCI wherever those exist in the region. Tide-swept channels are not represented but we consider that is an artefact of the definition of the habitat given to Regional Projects and needs to be re-addressed.
- 3.2.2. **Replication:** this has been achieved wherever possible and where it has not been possible the reasons have been provided. All broadscale habitats are replicated, except the rarely-recorded low energy circalittoral rock. Of the FOCI habitats, nine of the 14 that are recorded as occurring in the region meet replication targets. Those that do not are mostly indicated as having a limited distribution in the region. However, maerl beds are not so indicated (although they do have a limited distribution) and some further consideration of this FOCI is needed. Replication targets are met for 13 of the 29 FOCI species but many species that have not achieved such targets are either recorded at very few (sometimes one) locations or occur in existing MPAs or rMCZs/rRAs being proposed for habitats. If those species occur in an existing MPA or a habitat rMCZ/rRA, then those presences should be recorded as contributing to the network.
- 3.2.3. **Adequacy:** where appropriate, the proportions of broadscale habitats that are to be protected by MPAs lie between the minimum and maximum targets (or more than the maximum in some cases). Where present, broadscale habitats and FOCI, whose adequacy is to be assessed by the guidelines for replication, viability and connectivity, also achieve that goal.
- 3.2.4. **Viability:** Site-level reports map the size and dimensions of each rMCZ and viability has been met. The particular comment that Finding Sanctuary did not feel that the viability measures were useful in network design seems to relate especially to not having sufficient information to know the extent of BSH and FOCI when records were

spot locations. Furthermore, we know that some habitats and locations of FOCI species are naturally small in extent but are consistently present in repeat surveys (and so seem viable with time). We recommend that further information and expert opinion should be sought to satisfy, beyond reasonable doubt, that smaller sites or presence within a 'mixed' BSH and FOCI site, if designated, will properly contribute to an overall target of an ecologically coherent network.

- 3.2.5. **Connectivity:** Has been demonstrated for 40 km and 80 km distances within the Finding Sanctuary region. There is no reported analysis of connectivity across the boundaries with the Balanced Seas region, with offshore Irish Seas Conservation Zone region or with French, Irish and Welsh waters.
- 3.2.6. **Conservation Objectives:** Conservation Objectives have been identified by the SNCBs and the project team using information from the vulnerability assessment matched to the activities that take place within each rMCZ or rRA in order to identify whether Conservation Objectives are set to 'maintain', 'recover to favourable condition' or 'recover to reference condition'. Whilst the spreadsheets demonstrate the information used, it is not possible for us to judge whether the conclusions are well founded. This is a task which will have to be tackled by the SNCBs and management authorities. We also note that what is considered 'favourable condition' has still to be identified for each BSH or FOCI and that is a very substantial task. A more general commentary on Conservation Objectives is provided in section 7.1, where some inconsistencies are identified.
- 3.2.7. **Reference Areas:** The Conservation Objective for each feature in a reference area is automatically, and correctly, set to remove all damaging, disturbing, extractive activities. Finding Sanctuary proposed 13 reference areas; three offshore and ten inshore. Tables 11.2.9a-d summarize the recommendations against targets but do not make it clear which ones are considered to have achieved viability measures but do not in fact meet targets (because of linear or constrained habitats).

Intertidal BSH are almost entirely smaller than viability criteria require and, although Finding Sanctuary were correct to identify that adequate sized areas are difficult to find in linear or 'bounded' habitats, it is considered that larger examples of most are available. 'Intertidal sand and muddy sand' seems not to have a rRA assigned but is a widespread habitat. Intertidal biogenic reefs BSH, which does not have a rRA assigned, was equated to *Sabellaria alveolata* reefs but the area identified in Lyme Bay may be a poor example and anyway the size is related to FOCI habitat requirements. Low energy circalittoral rock (a sort of habitat that typically occurs in sealochs) may be present in parts of the south-west but it is accepted that no examples have been found by Finding Sanctuary.

Many of the broadscale habitat rRA areas do not meet viability guidelines for all of the constituent features. For example a 5x5 km reference area is proposed at Cape Bank and it is claimed without discussion that the five broad-scale habitats present within it meet the viability criterion, even though only one broadscale habitat covers an area of 20 km²; the largest of the remainder occupies 2 km². The target of achieving an average size for broadscale habitat reference areas has been missed – by a substantial margin. We recognise that there may be practical advantages to RAs that have several features and a more full account of our view is provided in section 7.4.

Of the FOCI habitats, 'Intertidal Underboulder Communities' are not identified for rRAs but there are some excellent example locations in south-west England. One very small area has been identified as a rRA for 'Estuarine Rocky Habitats' at the mouth of the River Yealm but does not correspond to the ecological description of the BAP habitat that is the FOCI, i.e. it is not estuarine. There are many other (23 locations are identified) estuarine rocky habitats in the rMCZ descriptions although, some of the best in the Tamar Estuary, have not been identified. 'Sea pen and burrowing megafauna communities' have not been identified but are considered to be represented in Portland Harbour and Plymouth Sound at least.

The Finding Sanctuary proposals miss some opportunities to include a range of features (for instance the Lyme Bay rRA which does not meet viability guidelines but is in an area with much more extensive shoreline) and, for some, there may be more suitable areas to identify as RAs – for instance the long-established monitoring sites at Duckpool for *Sabellaria alveolata* reefs. There are small rRAs where the relevant habitat is more extensive than the boundaries (for instance, the Erme Estuary RA) and it remains unclear why such a

small area has been identified. The rRA for estuarine rocky habitats at the mouth of the River Yealm is not estuarine but the area has been agreed by stakeholders and there are several features of interest along that coastline

FOCI species have been generally identified as occurring in rRAs for BSH or FOCI habitats which is appropriate. However some species, which have persistent populations in certain areas could have been selected but have not (or have not in an adequate area): *Gobius cobitus*, *Hippocampus spp.*, *Lucernariopsis spp.*, *Pollicipes pollicipes*, *Atrina fragilis* (as *A. pectinata*) and *Tenellia adspersa*. Specific comments are made later on the choice of some rMCZs for species FOCI.

Further work is required to ensure that irrelevant material is removed from site descriptions given that several of the rMCZs and rRAs have extraneous text that has been cut-and-pasted from previous descriptions (e.g. in the case of the Fal, text from Davies 1998).

3.2.8. Best Available Evidence: The Finding Sanctuary team have worked hard to identify and to provide stakeholders with the best available evidence for the distribution of the broadscale habitats and the FOCI habitats and species for which conservation targets have been set in the ENG. To ensure that the quality of evidence underpinning decisions is not in doubt, it is important to ensure that data traceability is maintained. There are clearly substantial gaps in knowledge about what is where but the final proposed MCZs do use best available evidence as effectively as possible for the listed habitats and species. The descriptions of each site are, however, very poor and some specific comments are made in part B about how some information has been used.

3.2.9. Areas of Additional Ecological Importance (AAEI): The final report indicates that “Estuaries [that are] are of additional ecological importance because of their high levels of productivity and ecological function as spawning and nursery areas” have been identified; that areas of “higher than average productivity” (often indicated by bird numbers or frontal activity) offshore and inshore coincide with rMCZs, and that “Many of the rMCZs, especially in the inshore, also coincide with areas of higher than average benthic biodiversity, both compared

against a national and a regional average.” It is understood that some boundaries have been adjusted to take account of areas of high known biodiversity but that is not explicitly stated. So, it seems that estuaries have been deliberately included as areas of high levels of productivity but incorporating or prioritizing sites by AAEL is more accidental than planned in offshore and inshore (open coast) areas. Also, the absence of rMCZs in the near offshore, where biodiversity data are available, is striking.

In the past, indicators of AAEL (such as bird foraging) have been used to justify so-called “water column protection”. Latterly the same indicators have been used to justify protection of the highly mobile predators, despite our advice on the subject in our responses to 3rd iteration proposals that this needed a well-argued case, i.e. the existence of AAEL were not sufficient in themselves. We conclude that, whilst indicators of AAEL were available to Finding Sanctuary, they have not been used in the manner required by the ENG.

3.2.10. Scientific value for research and monitoring: There is no evidence to suggest that rMCZs or rRAs have been chosen to maximise their utility for scientific research or to ease monitoring. Nevertheless if the network design principles are followed through to designation and a full set of viable Reference Areas is chosen and implemented a valuable research resource will be created.

3.2.11. MCZ boundaries: It is not clear how far guideline 25, relating to incorporation of margins to protect enclosed features, has been followed.

3.2.12. Geological and geomorphological features of interest: The three geological and geomorphological features of interest that exist within the Finding Sanctuary area are represented within the network to some extent – one completely; approximately half of the other two fall within rMCZs. This is a creditable outcome.

4. Assessment of the Balanced Seas Final Recommendations

4.1. Overview

- 4.1.1. The combination of MPAs and recommended network of MCZs, designated in its entirety, would meet the majority of the ENG criteria for an ecologically-coherent network. There are some outstanding issues concerning how accurately the network meets the viability and connectivity criteria, and the selection of reference areas, and these will require some further analysis as the proposals are taken forward.
- 4.1.2. The Balanced Seas project has used best-available evidence, and has demonstrated the inclusion of data on biodiversity and AAEl in its selection of rMCZs.
- 4.1.3. The recommended network has broad support across the stakeholder sectors, and has been signed off by the RSG. Continuing concerns of the RSG are clearly identified for the attention of the SNCBs and Defra.
- 4.1.4. We note that the final recommended boundaries of some MCZs and RAs have been adjusted to take account of conservation/science stakeholders and our concerns with particular regard to biodiversity features and that is commended.
- 4.1.5. We commend the Balanced Seas team and the RSG for their willingness to continuing to adjust their network as further data became available, such that changes in the adequacy targets for broadscale habitats have been met.

4.2. Detailed comments

- 4.2.1. **Representativity:** The ENG targets for representativity within the two biogeographic regions have been met for all broadscale habitats.

In some instances, where the representativity targets for habitats and species FOCI have not been met, this is because of the lack of suitable habitat in a particular biogeographic region, or a single occurrence of a FOCI in the whole Balanced Seas region.

- 4.2.2. **Replication:** ENG targets have been met for all possible broadscale habitats. Replication has been achieved well above the minimum required in the ENG. The good level of replication provides a greater level of safety within the network. BSH A4.3 (low energy circalittoral rock), cannot be replicated due to the presence of only one site with the regional project area

The ENG target of a minimum of 3 replicates has been met for 12 out of 17 habitat FOCI. Of the 5 missed, four habitat FOCI achieve the maximum number of replicates possible with the Balanced Seas region. The fifth habitat FOCI target, for “mud habitats in deep water” was missed due to uncertainty over both the description of this habitat, and the distribution of mud habitat in deep water in the Balanced Seas region. The RSG were not prepared to make further decisions on this habitat FOCI without further verification.

Species FOCI replication targets are met for 6 out of 14 species, with a further 6 species FOCI included up to the maximum number of locations available with the region. *Caecum armoricum* would appear to now be present only at a single site, Pagham Harbour. The replication score for *Padina* is artificially elevated (and therefore apparently meeting target), because both replicates are within the same rMCZ. This approach is contrary to our previous advice. The recommended network incorporates our advice on the treatment of seahorse records. Both seahorse species are listed as protected features in sites with suitable habitat, rather than constrained by individual records.

There is a clear need for further survey work to establish the current distribution of habitat FOCI species, as some records are old, and may not represent viable populations.

- 4.2.3. **Adequacy:** Has been met for all broadscale habitats.

- 4.2.4. **Viability:** 27 of 29 rMCZ meet the viability criteria set out in the ENG. A significant number of sites are actually smaller than the ENG stipulates, but are bounded habitats (estuaries, inlets) and, as such,

are naturally constrained. Other sites are proposed on the basis of species or habitat FOCI, for which the viability criteria are smaller.

BSH (Level 3 of EUNIS classification) of 5 km square or larger will include many Level 4 biotopes and their variants, Level 5 biotopes. The larger the area, the higher the likelihood that a wider variety of biotopes will be represented though some of those Level 4/5 biotopes will be quite small in extent. The extent to which a smaller area of BSH will encompass a variety of variety of Level 4/5 biotopes (and therefore species) as a large area of BSH, will depend on the nature of the biotopes in question.

Small patches of Level 4/5 biotopes may well be viable over time, i.e., they can 'always' be found in the same place and with the same characteristic species. Others biotopes may undergo a succession of patch dynamics and require a larger area to be viable. So a larger rMCZ will a priori, have higher levels of species richness and greater potential viability. The adequacy targets within the ENG were designed to act as a mechanism to 'capture' enough Broad Scale habitat at EUNIS level 3 to ensure the range and coverage of Level 4 / 5 biotopes and their species were included, while the viability target aims to ensure that BSH and FOCI within rMCZ are of sufficient size and scale to be stable over time.

We recommend that further analysis of the proposed network is conducted, to assess whether the BSH located within the network, though meeting the adequacy requirements of the ENG in total (see 2.3), do represent viable sized patches of each BSH within the rMCZ. This is because viability is being assessed at the scale of an individual rMCZ (see Table 8, p 50) or rRA site, and is not considering the area of each type of BSH located within any particular MCZ. This is particularly an issue with small rMCZ that are listed as containing a number of EUNIS level 3 broad scale habitats.

Where rMCZ and rRA fall short of the ENG viability guidelines, or where subsequent analysis reveals small areas of multiple BSH within a 'viable' rMCZ, further information and expert opinion may be required to satisfy, beyond reasonable doubt, that such sites, if designated, will properly contribute to an overall target of an ecologically coherent network.

4.2.5. **Connectivity:** MPAs of similar habitat (the same EUNIS level 2 habitat) are separated by no more than 40km. There is no reported

analysis of connectivity across the boundaries with Finding Sanctuary and Net Gain. Connectivity with protected areas in French and Belgian waters should also be assessed. These were recommendations in our feedback on the draft Final Recommendations.

- 4.2.6. **Conservation objectives:** These are included in the site descriptions. Many of the features are set at “maintain” pending further information of pressures that may require a “recover” objective. It is not clear what evidence has been used to determine the level of pressure caused by various activities, and hence the recommended conservation objective? Determination of pressures should require a similar level of evidence as is required for the ecological factors being used in MCZ identification. The reports states that fishing activity has not yet been assessed and its impacts determined. All the CO gives are therefore considered draft. A precautionary approach to CO is recommended in the absence of a detailed assessment of pressures. It is difficult to assess the overall ecological coherence of the proposed network until relevant conservation objectives are established.
- 4.2.7. **Reference Areas:** 25 recommended Reference Areas capture 42 of the 45 ENG features in the region. Table 12 provides a breakdown of these, and where they are located within a site apparently meeting viability criteria and where further clarification is needed. A number of broadscale habitats (A5.3 subtidal mud) and FOCI are not adequately represented in rRA, and the report provides an explanation of what further analysis is needed to ensure these can be brought into the network.

Table 12 needs to be carefully dissected, because the devil is in the detail. For example, BSH A2.1 Intertidal coarse sediment is listed as present and “*viably protected*” (term used on p61 of the report) in rRA 17 and 24. While 3.16 km² of this BSH exist in the BS area (Table 1), the two reference areas collectively protect only 0.03 km², less than 1% of a scare habitat in the BS region. Similarly, for BSH A2.4 Intertidal mixed sediments, only rRA1 is listed as a viable BSH site, but this location has only 0.05 km² of A2.4 within it. This results only 0.6% of the total area of BSH A2.4 (total area 8.06 km²) in the Balanced Sea

project area being protected in an rRA. The Balanced Seas area has 317 km² of Intertidal mud (BSH A2.3), and while Table 12 indicates that this habitat is viably protected in 8 rRA, in fact five of these RA have areas of A2.3 less than 0.06 km², and the total area in all eight RA is only 3.73 km², less than 1.2% of the broad scale habitat available. This is in a region characterised in large part by extensive intertidal soft sediment shores. While we recognise that, especially for intertidal BSH, there will be constraints, these examples illustrate how far from meeting the ENG target guidelines some of the reference area properties fall.

The total area of the 25 draft RA recommended as Reference Areas in Balanced Seas is 152.71 km², with an average size of 6.1 km². Given that the 3 offshore Reference Areas contribute 122.5 km² of this total, the remaining 21 inshore dRAs are in general (excluding the RA at St Catherine's Point, which is 13.81 km²) very small, with an average size of 0.78 km². Such values fall far short of the ENG recommendations (see previous SAP feedback). This shortfall for Reference Areas compromises the scientific basis of the network of highly protected areas

- 4.2.8. **Areas of Additional Ecological Importance:** There is clear evidence (section 5, p55 of the report and in the site descriptions) that Balanced Seas made good use of AA EI in building the site-specific cases.
- 4.2.9. **Best Available Evidence:** The Balanced Seas project has used best-available evidence, and has demonstrated the inclusion of data on biodiversity (from the MB102 Biodiversity layers) and AA EI in its selection of rMCZs. Balanced Seas are also commended for incorporating, at a late stage, the new data provided by the SE REC project, which entailed some substantial recalculation of targets in the latter months of the project.

In our assessment of evidence (see part B), we noted that stakeholder-derived information and datasets were used widely in the decisions surrounding rMCZ and rRA selection. Some quality control is required on these data, and our scoring reflects this concern. There are also additional reports, e.g. The MNCR Area Summaries report 'Inlets in Eastern England' (Hill et al. 1996) and the relevant chapters

in the MNCR Benthic marine ecosystems volume (Covey 1998a and 1998b) that should have been used to provide descriptions. It is also not explicit that references to SSSIs indicate that they are relevant SSSIs (i.e. have marine biology or geology/geomorphology cited as a reason for designation). This point was made early on by us. However, the wording on page 39 of the Final Recommendations summary reports suggests that any SSSI designation in the intertidal will have been included.

4.2.10. **Scientific value for research and monitoring:** There is no evidence to suggest that rMCZs or Reference Areas have been chosen to maximise their utility for scientific research or to ease monitoring. Nevertheless if the network design principles are followed through to designation and a full set of viable Reference Areas is chosen and implemented a valuable research resource will be created.

4.2.11. **MCZ boundaries:** The choice of dMCZ and Reference Area boundaries appears to have followed ENG guidance.

4.2.12. **Geological and geomorphological features of interest:** Nine Geological Conservation Review (GCR) sites and two geomorphological features are listed in the ENG for potential incorporation into the Balanced Seas MCZ network. Four GCR sites and one additional site have been identified as requiring Conservation Objectives in various rMCZs.

4.2.13. Balanced Seas are congratulated on targets met but we have concerns that some of the highest ranking sites for biodiversity or special features might not go forward as Reference Areas, and might be being replaced by sites that are not contended by fishing or other interest groups. As noted in the general comments, we consider that all Regional Projects have significantly failed to meet the requirement that the average size of reference areas should be between 10 and 20km in diameter.

5. Assessment of the Net Gain Final Recommendations

5.1. Overview

- 5.1.1. In general the report is well-written and gives a good indication of the ecological guidelines under which the network has been created. It gives sufficient detail to stand alone and be understood by a wide audience.
- 5.1.2. Representativity, replication, adequacy, viability and connectivity targets were met to a lesser or greater extent for 19 of 23 BSH and the Regional Project includes 22 of the 23 BSH; only subtidal macrophyte-dominated sediment is missing. The recommendations include 14 habitat FOCI and 12 low mobility FOCI.
- 5.1.3. The combination of MPAs and network of rMCZs, designated in its entirety, would meet the majority of the ENG criteria for an ecologically-coherent network, if the protected proportion of subtidal mud is increased to at least the minimum required by the ENG.
- 5.1.4. There are several aspects to be commended: that NG had its own list of broad principles, that there was an extensive and well-planned consultation, that the report clearly indicates when information/data were available and how they were used. The NG innovative development and use of database tools for the sensitivity assessment is also commended.
- 5.1.5. The Net Gain stakeholders appear to have minimised the areas designated.
- 5.1.6. The preponderance of rMCZ conservation objectives set to 'maintain' and the small number and size of rRAs lead to concern that levels of protection will be inadequate.
- 5.1.7. The tables for each rMCZ and rRA give footnotes which indicate that certain features which could exist in a site are not offered for

5.1.8. It is noted that existing and proposed MPA/MCZ together enclose 30% of the lower and middle English N Sea region although two-thirds of that is from the existing MPAs.

5.2. Detailed comments

5.2.1. **Representativity:** Representativity for habitats are mostly met for all except *Modiolus* beds (there are no beds but isolated patches), mud habitats, and tide-swept channels (according to the definition of this feature provided by the SNCBs). However the representativity and replication for spp. FOCI are mostly not met and for mobile species eel not met - the report gives the reasons for this omission (usually data limitations, or poor distributional data). With regard to the eel, we remain unconvinced of this inability to meet the criteria given its wide-spread distribution and abundance in the adjacent estuaries.

The analysis and recommendations do not focus on the biogeographical aspects of the area, for example in indicating the differences between the northern and southern parts of the area, and the influence of the Flamborough-Helgoland Front, nor the links with the Scottish approach and the Balanced Seas area.

5.2.2. **Replication:** This is mostly met for BSH and habitat FOCI and where the criteria have not been met reassurance is given that this is due to a lack of sufficient reliable records of the feature in the Net Gain area (deep mud areas) or sufficient area (subtidal macrophyte-dominated sediment). Some features will not occur due to the nature of the area – e.g. classic *Sabellaria* reefs do not occur in that form as in the North Sea they are mostly low-lying encrusting forms. Unlike other Regional Projects, Net Gain have the category of ‘nearly met’ for replication, i.e. one more replicate would allow the guideline to be met. We take the

view that this is unnecessary and rather misses the point that such a criterion is either met or not met.

- 5.2.3. **Adequacy:** Adequacy targets are met between the minimum and maximum targets – in some cases above the maximum – with the exception of A5.3 subtidal mud which falls short of the minimum target by 83.22 km², and low energy infralittoral rock. No commentary is offered on broadscale habitats for which replication, viability and connectivity guidelines are to be used to meet the principle of adequacy.
- 5.2.4. **Viability:** The site reports indicate that the size of the rMCZ in general meet the minimum targets but several do not meet this target often due to either the boundaries of an estuary or intertidal area, or due to the patch size for habitats or dispersion of species; it is considered that some are trimmed to the absolute minimum. We previously commented on the general lack of viability of reference areas offered by the Regional Hubs and StAP.
- 5.2.5. **Connectivity:** this is described as being based on assumed shortest distance/straight lines between sites and the final report gives the concentric circles and distances on maps for each major habitat type. Following our earlier comments, the maps are now clearer for users and there is a good description of the criteria being met. The connectivity are met for some BSH but not in all areas for littoral rock, infralittoral rock and subtidal sediments; given the paucity of hard substrata in the North Sea the former is to be expected.

Although advised to be of secondary importance generally, connectivity is a significant issue for the Net Gain region because of its size, the predominance of sedimentary habitats and the importance of widespread small occurrences of other habitats with the species that they sustain. We comment on the difficulties of taking transport into account in 5.3.3. It is regretted that it has not proved possible to make allowances for the site-specific differences, hydrographic patterns (such as the influence of the Flamborough-Helgoland front on north-south larval transport) and time to metamorphosis of many larvae. There is welcome commentary on the extent to which connectivity has been established with Finding Sanctuary and Scottish, Dutch, Belgian and German authorities, across their borders. This is particularly the case for the sites around the Dogger Bank/Cleaverbank proposed Special Area of Conservation (pSAC) and NG7.

5.2.6. **Levels of protection:** are effectively defined by:

5.2.6.1. the setting of **Conservation Objectives**. Most of the conservation objectives for the broadscale habitats are set as being 'to maintain'. We comment on the considerable doubts we have about this in section 7.1

5.2.6.2. the **Reference Areas (RAs)** are shown on site maps against a background of broadscale habitats and FOCI, and in some detail as site discussions, allowing inference of the rationale for each RA and its size. No attempt is made to demonstrate that the requirements of the ENG have been met. All sites appear to be the minimum possible size, commensurate with guidance for individual sites. We comment on this in section.7.4.

5.2.7. **Best Available Evidence:** Net Gain stakeholders have been critical of the quality of evidence available to identify rMCZs and rRAs and have challenged some broadscale habitat data on the basis of their own information/knowledge. We provide a separate assessment of whether the best available information has been used in part B. As yet it is not clear that the recent Regional Environmental Characterisation (REC) data (outer Humber) and analysis has been used – it is acknowledged that this has only recently appeared but it has collated a large amount of information and produced a new version of biotopes present. To ensure that the quality of evidence underpinning decisions is not in doubt, it is important to ensure that data traceability is maintained.

5.2.8. **Areas of Additional Ecological Importance:** Net Gain were earlier applauded for their ranking of MCZ proposals according to the concurrence of AA EI. Since then it is notable that some stakeholders, seeking to maximise the ecological benefits of the network, have been critical of the extent to which sites and boundaries have been prioritised. It is difficult to form a judgement on this but anecdotally at least socio-economic cost minimisation has been a more powerful influence than arguments designed to maximise biodiversity and productivity in rMCZs or choosing rRAs. In the final report, it is still unclear how the AA EI data have been used although a large amount of evidence cited refers to seabirds and sea mammals.

5.2.9. **Scientific Value for research and monitoring:** There is no discussion or evidence to suggest that the guideline has had any impact on the choice of any rMCZ or rRA. However, in the Final Report there are a few examples of areas that are valuable for research and also a few occasions where ongoing monitoring is mentioned. Despite this, Net Gain do suggest that there are no relevant monitoring schemes in their area but they should check and refer to the 30+ sites monitored under the national Clean Seas Environmental Monitoring Programme (CSEMP). The linking of the recommended sites to that network needs to be explored further.

5.2.10. **MCZ Boundaries:** From the site selection discussions provided in the report, the emphasis appears to be on minimising perceived socio-economic conflicts rather than on encompassing features. There also appears to be no indication that Guideline 25, relating to incorporation of margins around features being protected, has been followed. Boundaries generally follow straight lines, shorelines or estuary boundaries. For example, NG9 has a cut out to avoid a wind farm.

The final report indicates that co-location was considered in the discussions with stakeholders firstly in discussing the ecological and socio-economic aspects. Secondly, in the Vulnerability Assessment in which the spatial overlap of conservation features and human activity was discussed together with Conservation Objectives. However, co-location is only briefly considered and even then it is not clear if this is treated as a positive or negative approach, i.e. whether there are benefits or whether the stakeholders regard this as unsuitable in principle.

5.2.11. **Geological and geomorphological features of interest:** Individual site descriptions make reference to protection of such features. With regard to fulfilling guidelines 29 and 30, a summary table of the geological features and the conservation objectives for these has been provided.

6. Assessment of the ISCZ Final Recommendations

6.1. Overview

6.1.1. The report is well written and provides reassurance that sound procedures have been followed. The majority of areas recommended

to fall within the network are supported by high quality evidence that is relevant to the area in question.

- 6.1.2. An explanation of changes made to the distribution of broadscale habitats provided by the SNCBs is provided. It is not clear that these changes to the distribution of broadscale habitats were all sustained by published or otherwise verifiable evidence.
- 6.1.3. The combination of MPAs and network of recommended Marine Conservation Zones, designated in its entirety, would meet the majority of the Ecological Network Guidance criteria for an ecologically-coherent network, if the protected proportion of subtidal mud is increased to at least the minimum required by the Ecological Network Guidance. This broadscale habitat is of considerable ecological importance which increases the need for this issue to be addressed.
- 6.1.4. Despite repeated requests to reconsider their decision the RSG refuses to recommend an MCZ in Morecambe Bay to protect broadscale habitats and FOCI that exist but are not designated in the SAC there. This prevents achievement of some of the representativity and replication targets.
- 6.1.5. No summary is provided of the extent to which the requirements of the ENG for Reference Areas have been met. Fourteen rRAs have been identified with seven inshore (bounded at the coast), none of which meet the viability criterion and seven are offshore rRAs, with four not meeting the viability criterion.

6.2. Detailed Comments

- 6.2.1. **Representativity:** The rMCZ network is representative of all broad-scale habitats identified in the ENG that are present in the ISCZ project area with the exception of subtidal macrophyte-dominated sediments (A5.4). The habitat FOCI sheltered muddy gravels are not represented either but both broadscale habitat and FOCI exist in Morecambe Bay. The RSG refused to recommend an MCZ in Morecambe Bay on the grounds that they did not wish to impose further restrictions in the existing SAC. We do not consider that is a

satisfactory rationale without an impact assessment, and have made the same point several times in the past, to no avail.

We are able to confirm that a sound case has been made to designate an extension to rMCZ 11 for the non-ENG feature Black Guillemot. St Bees Head is the only nesting site for these birds in England and is an SSSI. It abuts the rMCZ. The extension is sought to protect loafing and feeding birds in an area some 500m seaward of the intertidal zone in the vicinity of the cliffs against gill netting and visual disturbance.

- 6.2.2. **Replication:** The target of at least 2 broad-scale habitat and 3 to 5 FOCI replicates appears to have been met where their distribution allows, except in the case of High Energy Circalittoral Rock and Subtidal Macrophyte-dominated Sediments. Examples of both occur in Morecambe Bay but again the RSG's refusal to locate an rMCZ there means that these examples are not afforded the required protection. FOCI in the region are replicated where their distribution allows.
- 6.2.3. **Adequacy:** As noted in paragraph 6.1.3, the minimum target for A5.3 Subtidal Mud will be met only if the adjoining possible colocation zone is taken into rMCZ2 or the boundaries of other rMCZs are adjusted. The shortfall without these changes will amount to 59 km² of this broad-scale habitat. We have some concerns that the subtidal mud habitat in the proposed co-location zone may be altered by the effects of both increased mixing in the water column and scour on the seabed produced by the wind farm pylons. This will need to be checked, by modelling at least, before a decision is reached as to whether such a co-location would be appropriate. The minimum adequacy targets for High Energy Infralittoral Rock and Moderate Energy Circalittoral Rock are not met but these are only present in small quantities (~5 km²) in the region. All other broad-scale habitats are adequately represented in the network.
- 6.2.4. **Viability:** All rMCZs except rMCZ 11 (Cumbrian Coast) are viable against the criteria for broadscale habitats or FOCI as appropriate. rMCZ 11 is largely intertidal and is bounded therefore. It extends some 20km along the coast and in our view there is no doubt that it is viable for the habitats and species that are characteristic of the broadscale habitats and FOCI for which it is designated.

6.2.5. **Connectivity:** We consider that the connectivity principle, as defined in the ENG, has been met for all rMCZs in the ISCZ region except rMCZ 6 South Rigg. This is located in the extreme north western sector of the ISCZ region and might be expected to have connectivity with MPAs in Scottish or Northern Irish waters containing circalittoral rock A4. This remains to be verified in due course.

6.2.6. **Levels of protection:** are effectively defined by:

6.2.6.1. the setting of **Conservation Objectives**. With the exception of the three estuary sites (rMCZs 16 to 18) and rMCZs 8 and 10, which have COs to 'maintain', all the remaining rMCZs have COs set to 'recover' for at least two broadscale habitat/ FOCI; some are set to recover for all constituent features. This suggests that the RSG is making considered recommendations, although the evidence used for this is not visible. As noted in paragraph 7.1.5, ISCZ (and the other Regional Projects) do not provide the evidence base for these decisions with the Recommendations. To their credit, summary Impact Assessment Assumptions are provided in Annex 3 and Annex 2 of the ISCZ Final Recommendations and they list the sources of socioeconomic data used by the Project. These data sources at least demonstrate transparency, but not the quantifiable evidence used in forming judgements about the pressures likely to be experienced in the individual rMCZs.

6.2.6.2. the **Reference Areas (RAs)**. Fourteen RAs are recommended. Seven of these are bounded at the coast and protect 4.4 km² of FOCI and broadscale habitats. However, none meet the viability criterion. The 7 offshore rRAs protect 220km² of mainly broadscale habitats but also some FOCI; only 4 are viable. The average size of the unbounded RAs is 31.4 km², well short of the 80 to 310 km² required. However, the recommended rRA Mid St George's channel provides considerable protection for 103 km² of subtidal sediments and moderate energy circalittoral rock and associated habitat FOCI.

6.2.7. **Best Available Evidence:** There has been a welcome step change in the effort devoted by ISCZ to assembling sound ecological data. ISCZ have made good use of UKSeaMap and other data sources made

available by the SNCBs. However, some key data sources that are in the form of survey reports and the results of surveys have not, apparently, been used and much more could be done to improve the site descriptions.

- 6.2.8. **Areas of Additional Ecological Importance (AAEI):** Although relevant evidence has been assembled and is shown in the iPDF, there are few signs that AAEI have had a significant effect on the selection of rMCZs or rRAs. No explanation is provided of how choices of datasets that are surrogates for productivity or biodiversity have influenced site or boundary choices in a systematic manner.
- 6.2.9. **Scientific Value:** There is no discussion of this driver for the selection of MCZs or Reference Areas, notwithstanding the long history of scientific study of the Irish Sea. Several sites chosen as rMCZs have high quality ecological survey data so there are arguments to be made for them to be included in the network under this guideline.
- 6.2.10. **MCZ boundaries:** There is no evidence that the guidelines in section 6.3 have had a significant influence on boundary design, beyond the use of straight lines and geo political boundaries to make maximum use of space and possible future connectivity in this very cramped and awkwardly shaped region. Perhaps that is inevitable. Nevertheless, guideline 25 relating to the incorporation of margins around features to be protected should be followed.
- 6.2.11. **Geological and Geomorphological Features:** the network protects two geological and geomorphological features, drumlins in rMCZ 3 and the Irish Sea Mounds in rMCZ 6.

7. General Comments

7.1. Conservation Objectives

- 7.1.1. Conservation Objective Guidance (COG) for the setting of Conservation Objectives for designated features within an MCZ has been provided by the SNCBs². In effect this requires an understanding of the sensitivity of a feature to pressures to which it is exposed – the so called Vulnerability Assessment. Where the feature is judged to

² conservation-objective-guidance_tcm6-24853.pdf

have a high or moderate sensitivity to such pressures the conservation objective is set to “recover”, otherwise the objective is to “maintain”. The former objective requires new management measures to reduce the pressures; the latter does not, although it may require management to preclude certain new activities from taking place.

7.1.2. Two scientific issues are raised by this procedure:

7.1.2.1. *The validity and utility of the matrices used especially for Broad Scale Habitats.* The process of generating the matrices required a good deal of expert judgement and the validating evidence is inevitably sparse and qualitative. Nevertheless the Defra contract MB0102³, which informed the construction of the activities pressures matrix, drew upon a wide range of scientific expertise and associated evidence so we accept that the ‘best available evidence’ has been used in generating these matrices. However, the wide range of sensitivities identified and the generally low confidence in those conclusions for broadscale habitats means that they are scarcely applicable for such broad categories when the more precise habitats (i.e. at level 4/5 of the EUNIS classification) and/or the actual species present are not used for assessment and may not be known. There is an expectation that more precision will be achieved when site-level objectives are based on level 4/5 biotopes and the species that are present within a rMCZ/rRA (where known). Given that sensitivity assessments are not available for all biotopes and species, a degree of experience and knowledge of assessing ‘sensitivity’ will be needed to reach robust conclusions about sensitivity to different pressures.

7.1.2.2. *The implication that the removal or mediation of a pressure will result in ‘recovery’ of the feature.* The assumption that removal of an anthropogenic pressure will return a feature to some pre-existing ‘good status’ is unsafe and likely to raise false expectations and possibly even challenges by stakeholders. Although a footnote in the COG states that ‘Recovery does not necessarily mean returning to former state’, the term is regularly

³ Report No 22 Task 3 Development of a Sensitivity Matrix (pressures-MCZ/MPA features)

used to mean ‘to restore attributes listed in Conservation Objectives’. We emphasise that by definition, any objective of ‘to restore’ means that the marine environmental managers have in mind the situation to which it is restored (either a historical baseline or spatial comparison). At best, the mitigation of anthropogenic pressures will remove a local threat. But habitats and species are exposed to many other threats, such as predation by other species and disease, or environmental changes that cannot be mediated locally, such as those brought about by climate change⁴. Indeed, climate change also means that the condition relative to any historical baseline is moving with time. Furthermore, some notice needs to be taken of recovery potential. Some species that may have been lost or reduced in abundance as a result of human activities may, because of their life history characteristics (including very infrequent or localised recruitment and/or slow growth), not readily come back even when pressures are removed. In some cases, habitats have been destroyed or altered to some modified state by human activities and so the species and communities that were there in previous times will not re-occur. Thus recovery to a desirable status may require more actions than the local removal of anthropogenic pressures. Such actions are likely to include measurement of the current status of features and similar measurements to verify whether management measures are effective in achieving goals. The Marine Strategy Framework Directive and OSPAR place the measurement of ecological status at the heart of their strategy and the achievement of defined Good Ecological Status (GES) as the fundamental objective. The mitigation of harmful pressures will underpin the delivery of GES but in some instances further actions will be necessary.

7.1.3. We consider that it is unsafe to assume that features:

7.1.3.1. will always have been damaged at a location solely as a result of local human activities.

⁴ All conservation objectives include the caveat ‘subject to natural change’, which may be intended to deal with this concern, but it begs the question of what such changes comprise and how they are to be determined.

- 7.1.3.2. will be maintained in their current (largely unknown⁵) state provided that there is no increase in the existing anthropogenic pressure to which they are subject, since ecosystems change naturally.
- 7.1.3.3. will recover to some good (but unspecified⁶) state if existing anthropogenic pressures to which they are subject are removed or mediated, as in some cases damage may have occurred that is irreversible over timescales much greater than many human generations. This is not to say that managing damaging activities would be futile, since removal of damaging activities is likely to provide many ecological and conservation benefits, although the timescales and trajectory of that recovery are uncertain.
- 7.1.4. We emphasise that removal of the damaging pressures within MCZs must be a primary goal as this will be more beneficial to marine conservation than not removing them. Accordingly, an alternative approach is recommended, where insufficient information is available at present to define the condition of features for which the MCZ is designated: Given that ecological change within rMCZs is inevitable, the stated goal should not be to return these areas to an unknown pre-existing state but to mitigate damaging practices within them. The sparsely surveyed areas in such waters to the west of Scotland may serve as a useful case study, where protected areas were designed by ICES in liaison with NEAFC, the Scottish Fishermen's Federation and the NWWRAC based on known impacts of damaging practices (Hall-Spencer et al., 2009). In recognition of the expense of offshore survey work the target of the marine protected areas was to remove known damaging practices, rather than base a target on recovery of seabed habitats to a certain ecological status.
- 7.1.5. We accept that the approach adopted by the Regional Projects, under the direction of the SNCBs has had the effect of identifying these damaging pressures. The difference between the two approaches arises because we are advocating adoption of a process rather an achievement of a certain outcome, which cannot be realised when the

⁵ Beyond their existence

⁶ Beyond the reference to 'quality objectives under EU Environmental Directives'

condition of features is unknown, and the trajectory of change following protection is uncertain.

- 7.1.6. We welcome the statement in the introduction to the Conservation Objective spreadsheets that “The SNCBs expect to undertake further work to develop more detailed targets that describe Favourable Condition of MCZ features to support our formal advice to Public Authorities post designation. This work is similar to the current process under Natura.” We also observe that more clarity is needed as to how ‘Recover’ objectives were separated into “Recover to favourable condition” or “Recover to reference condition”, both of which imply that the favourable and reference conditions are known and that recommendations of removing activities to return to those will be legally defensible.
- 7.1.7. We note that the evidence base used by the Regional Projects for the determination of the pressures is not provided with the Recommendations, although some descriptive socio-economic information is provided in the iPDFs and the results can be inferred from the COs. It may be that the detailed evidence forms part of the Impact Assessments. However, we suggest that the evidence which is used to infer pressures should achieve quality and transparency standards similar to those which we expect to be available for defining the ecology.
- 7.1.8. We note that there is an obvious incentive for stakeholders undertaking activities that generate pressures on features within an MCZ to seek Conservation Objectives to ‘maintain’, implying that there are no damaging pressures from the activities currently taking place within the MCZ and hence avoid potentially restrictive management measures. Regional discrepancies have arisen whereby the same types of habitat have been allocated different draft Conservation Objectives in the absence of evidence about the likely condition of these habitats. Almost all of the offshore sedimentary habitats within the Finding Sanctuary rMCZs have draft Conservation Objectives set at ‘recover’, which is assumed by their stakeholders to mean the removal of towed demersal fishing gear. This seems sensible, given that towed demersal fishing activities occur in the offshore rMCZ areas

of Finding Sanctuary, and given that there is strong scientific evidence that towed demersal fishing gear compromises the ecological condition of a range of sediment habitats (Fogarty & Murawski, 1998; Marawski et al., 2000; Hall-Spencer & Moore 2000; Kaiser et al. 2000, 2006; Lindholm et al., 2004; Link et al. 2005; Malik & Mayer, 2007). In a few Finding Sanctuary offshore rMCZs certain types of sedimentary habitat are set to 'maintain', without a clear rationale for the discrepancy.

7.1.9. In contrast to the Finding Sanctuary region, in Net Gain most of the offshore rMCZ (e.g. 17, Fulmar) have recommended Conservation Objectives for sediment habitats set as 'maintain'. As no evidence is provided about the condition of seabed habitats in such areas, and given the large body of scientific evidence concerning the effects of chronic fishing disturbance to such habitats (e.g. Kaiser et al., 2000, 2006), the default Conservation Objective might be expected to be 'recover'. Again, we note that there are some environments that are far more resilient to bottom fishing disturbance than others, and that the intensity and frequency of this disturbance will determine the amount of change that has occurred in a given area. In the large Balanced Seas offshore rMCZ 14 (Offshore Brighton) the sand and gravel has a recommended Conservation Objective set at 'maintain' whereas the 'subtidal mixed sediments' in this rMCZ has a Conservation Objective of 'recover'. Similarly, within offshore rMCZs in the ISCZ there are also mismatches with some coarse sediments, for example, set to 'recover' (e.g. rMCZ 4) and other coarse sediments set to 'maintain' (e.g. rMCZ3). As work continues on the draft Conservation Objectives, we recommend that 'maintain' is only used where best available evidence is provided in the site descriptions that shows that the level of permitted activities taking place at the site (see section 7.1.7) are not likely to affect the condition of the conservation feature.

7.1.10. There are other Conservation Objectives that SAP members do not feel reflect the condition of features (whether unaffected or affected by activities) and, all-in-all, feel that further peer review of the conclusions regarding Conservation Objectives is required, especially by scientists with relevant local experience.

7.2. Monitoring and surveillance

- 7.2.1. The Marine Conservation and Coastal Access (MCCS) Act paragraph 124(3) permits appropriate authorities to direct the SNCBs to conduct necessary monitoring. Such direction and funding to make it possible should be a priority. Monitoring of human activities is essential to test presumptions that management activities are being effective and MCCA sections 125 and 126 require the Marine Management Organisation, IFCAs and harbour authorities to take active steps to achieve the Conservation Objectives for MCZs when exercising their functions and to consider the effect of proposed activities on MCZ features before authorising the activities. Such direction and funding to make this possible will underpin the future success of the RAs, MCZs and MPAs in delivery of an ecologically coherent network of marine protected areas.
- 7.2.2. Monitoring of habitats and species within selected rMCZs and rRAs is recommended to test presumptions that management activities are being effective. Monitoring *sensu stricto* (as opposed to surveillance) also implies that changes are being judged against an expected, pre-determined outcome (Elliott, 2011; Gray & Elliott 2009). This is skilful work and increasingly costly from intertidal to deep waters. Well thought-out sampling, capable of testing scientific hypotheses to acceptable levels of confidence is required. Monitoring in rRAs to provide baselines for these purposes should be a priority. However, the repercussions and logic of having RA embedded within MCZ require hypotheses to be tested rigorously.
- 7.2.3. The approach advocated in paragraph 7.1.9 is based on acceptance of the practical difficulties of monitoring in deep water in particular.
- 7.2.4. We consider that surveillance of potentially damaging activities in and around rMCZs and rRAs should be undertaken as a means of increasing the science base on which are based future assumptions of the 'activity-pressures-unacceptable adverse impact' sequence.

7.3. Uncertainty and risk

- 7.3.1. The ENG provides a number of numerical guidelines, particularly for the design principles of replication, viability, adequacy and connectivity. Some guidelines suggest a range of acceptable targets. In all cases justification is provided in the ENG and reference is made to the underpinning rationale, research and wider international experience. There is some evidence that the essence of the rationale for the targets and ranges has not been understood and reflected in the Final Recommendations. Specifically, the idea that a range is a measure of uncertainty does not seem to have been factored into decision making. The choice of the minimum of a range generally carries more risk that the objective of the target will not be achieved than if the maximum is chosen. But it appears that, where there is choice, the minimum has become the target for the Final Recommendations.
- 7.3.2. Uncertainty is likely to arise from a number of sources but the quality of available evidence, from which the distribution of habitats and features is inferred, is always going to be important in assessing uncertainty and hence the risk that ENG design criteria will not be met in practice. The quality of some of that evidence is reviewed in part B of this report.
- 7.3.3. The effects of uncertainty about the distribution of features are most relevant to the achievement of the design principles adequacy and viability. Uncertainty about connectivity is also an issue but is accepted as of secondary importance in the ENG. The use of a rule of thumb, based on proximity (40-80 km) of similar habitats, effectively accepts that present empirical information is too uncertain (or unknown) at the small spatial scales necessary to factor-in location-specific and species-specific transport between sites. A more detailed modelling and empirical approach would be needed to account for such localized species-specific transport and is beyond the scope of the MCZ project and the associated available data. The unavailability of such data increases uncertainty and the need for a precautionary approach. Hydrodynamic modelling and empirical studies of species-specific

dispersion and connectivity in relation to MPAs are now being carried out in other parts of the world (Christie et al. 2010, Hogan et al. 2010).

7.3.3.1. The *adequacy* principle rests on the widely accepted relationship between the extent of a given habitat and the number of species that it can support. The relationship, established empirically, is different for different habitats. It can be used to estimate the proportion of a broadscale habitat required to protect (within MPAs) a particular proportion of the different species likely to occupy that habitat. The SNCBs suggest that the goal should be to protect the majority of such species, defined as 70-80%. This equates to a requirement to protect between 10% and 40% of the habitat; the proportions vary with habitat. The relationships for each habitat and associated species have been derived from experimental data by Carlo Rondinini (JNCC report 439, 2011). His comments after presenting the results and reviewing sources of uncertainty, which include the quality and extent of the data samples, are instructive:

*“The estimates presented here represent the best available data on the benthic diversity of marine habitat types in the UK. Yet, due to the limitations and uncertainties outlined above, any conservation targets developed based on these results should be considered as **underestimates of the true conservation targets required**. This should not deter decision makers from using them. On the contrary, they should be used as a starting point for setting targets that will **likely need to be increased in the future**. Moreover, following the precautionary approach, where there is uncertainty and known underestimation higher conservation targets should be set than those simply derived from this current analysis”.*

The emphasis has been added but highlights the risks of relying on data which is anything other than the best available and using the minimum target derived in this way as the adequacy target. Our advice to Balanced Seas that the higher quality REC data might allow achievement of a slighter lower adequacy target, above the minimum, was based on this consideration. This advice resulted in subsequent correspondence from the Wildlife

Trusts to the SAP, suggesting that such an approach was weakening the adequacy of the network – which demonstrates the point that the relationship between risk and uncertainty had not been fully understood.

Roberts et al., NECRO 37 'Guidance on the size and spacing of Marine Protected Areas in England' also points out that species richness is a function of the level of protection afforded to a habitat; damaged habitats are more likely to have lower biodiversity (although naturally highly variable habitats such as estuaries will also have a lower species richness (Elliott & Quintino 2007)). This is not factored into the ENG adequacy targets and increases the risk that a minimum adequacy target for habitats under pressure will not deliver the species richness being sought. Hence we caution on the uncritical adoption of marine nature conservation being based on structural rather than functional attributes of sites. Unfortunately it is just those broadscale habitats – such as subtidal mud over which *Nephrops* fishing is concentrated – that are being recommended at or below the minimum.

We understand that socio-economic pressures have resulted in Recommendations to protect subtidal mud (A5.3) that fall below the minimum adequacy requirement in the Net Gain and IS CZ regions. For the reasons outlined above significant risks are being run that protection of the species and biotopes which depend upon this broadscale habit will be less than adequate.

7.3.4. OSPAR recommend that that the size of MPAs should take into account species life-history, population structure, habitat quality, the quality of the surrounding areas and connectivity to other sites. Viable sites are those which are designed to achieve this goal. Again there is conflict between the need to protect biodiversity in sites that are viable (for the broadscale habitats and FOCI for which they are designated) and commercial activities in and around them. There is a strong tendency for recommendations for near shore rMCZs and, in particular rRA wherever they occur, to be at or below the minimum size recommended in the ENG. We and SNCBs have supported proposals for rMCZs and rRAs designated for broadscale habitats below the minimum size of 5 km diameter where the habitat in question is

naturally constrained, e.g. at a coastline, but obviously viable in the sense of self-sustaining. However, none of the Regional Projects have acknowledged or appear to have used the guidance on the recommended average size of such rMCZs and rRAs of 10 to 20 km diameter. That is to deny the wide range of movement and dispersal distance of some species and the need to have a range of MPA sizes to afford protection for them; the science behind the guidelines has been neglected and minimum targets have been adopted. Because there are some very large MPAs in the composite network, this is not a particular problem in practice for MCZs designated for some broadscale habitats but has resulted in a network of RAs that is not fit for purpose.

7.4. Reference Areas

- 7.4.1. We consider that Regional Projects and their RSGs have failed to meet important requirements of the ENG to identify a complete set of viable RAs. This is very regrettable given their importance in providing (a) the maximum feasible protection for flora and fauna that are rare, threatened or representative of UK biodiversity, and (b) sound scientific benchmarks for the future evidence based management of the MPA network. The criteria for viability of broadscale habitats and FOCI are set out in section 4.5 of the ENG - guidelines 9 and 10. Guideline 16 in section 4.7 indicates that these criteria are to be applied to reference areas.
- 7.4.2. Since the publication of the ENG both we and SNCBs have advised that where broadscale habitats and habitat FOCI are naturally bounded, e.g. by a shoreline or physical feature such as a reef, the viability criteria can be relaxed to recognise these bounds. This and the preponderance of FOCI that have a minimum viable patch size of ~0.2 km² have resulted in the recommendation of many small RAs near shore for such FOCI and (necessarily) for intertidal broadscale habitats (A1 and A2). The requirement for an a long-shore dimension, for example, of at least 5 km for such broadscale habitats, where the distribution allows, has generally been neglected in response to socio-economic pressures and the fraction of near and inshore habitats that

are afforded strong protection is disappointingly small – see paragraph 4.2.7 for example

- 7.4.3. Unfortunately Regional Projects and their RSGs have interpreted guideline 9 as implying that 5x5 km (=25 km²) is the target area for a broadscale habitat reference area away from the coast (e.g. A3, A4, A5 and A6). It is not. The minimum acceptable diameter of 5 km for a single RA implies a minimum viable area of 20 km² and the goal is to achieve an average diameter of between 10 and 20 km, i.e. an average area of the broadscale habitat RAs within a region of between 80 and 310 km².
- 7.4.4. We and the SNCBs have also encouraged the Regional Projects to recommend RAs to protect multiple broadscale habitats, as a further reason to recommend some larger RAs. Again unfortunately, RSGs have recommended sites of less than 20 km² designated for as many as five broadscale habitats, some occupying 0.5 km² - e.g. St Catherine's Point RA recommended by Balanced Seas. This is not within the letter or spirit of the guidance.
- 7.4.5. An analysis of rRAs that are not bounded on at least one border demonstrates that the average size of the RAs recommended by Balanced Seas, Finding Sanctuary, ISCZ and Net Gain are 34 km², 47 km², 31 km² and 26 km² respectively. These areas represent approximately half or less of the minimum average size required by the ENG. It should also be noted that these unbounded rRAs represent less than half of all the recommended RAs in all four projects, so the majority of RA sites chosen are constrained, small, and do not meet ENG guidelines.
- 7.4.6. We suggest that this is an unsatisfactory state of affairs which will require Defra and the SNCBs to return to the design of the Reference Area network perhaps initially by testing the outcome, physical feasibility and socioeconomic consequences of expanding the recommended RAs.

8. Conclusions and Recommendations

8.1. Finding Sanctuary

- 8.1.1. The combination of MPAs and network of recommended Marine Conservation Zones, designated in its entirety, would meet the majority of the Ecological Network Guidance criteria for an ecologically-coherent network.
- 8.1.2. The identification of Reference Areas fails to meet the requirement of the ENG and coupled with doubts over the consistency of Conservation Objectives leads to concern that levels of protection will be inadequate.

8.2. Balanced Seas

- 8.2.1. The combination of MPAs and network of recommended Marine Conservation Zones, designated in its entirety, would meet the majority of the Ecological Network Guidance criteria for an ecologically-coherent network.
- 8.2.2. There are some outstanding issues concerning how accurately the network meets the viability and connectivity criteria, and the selection of reference areas, and these will require some further analysis as the proposals are taken forward.

8.3. Net Gain

- 8.3.1. The combination of MPAs and network of recommended Marine Conservation Zones, designated in its entirety, would meet the majority of the Ecological Network Guidance criteria for an ecologically-coherent network, if the protected proportion of subtidal mud is increased to at least the minimum required by the Ecological Network Guidance.
- 8.3.2. The preponderance of recommended Marine Conservation Zone conservation objectives set to 'maintain' and the small number and

size of recommended Reference Areas lead to concern that levels of protection will be inadequate.

8.4. ISCZ

- 8.4.1. The combination of MPAs and network of recommended Marine Conservation Zones, designated in its entirety, would meet the majority of the Ecological Network Guidance criteria for an ecologically-coherent network, if the protected proportion of subtidal mud is increased to at least the minimum required by the Ecological Network Guidance. This habitat is of considerable ecological importance which increases the need for this issue to be addressed.
- 8.4.2. Despite repeated requests to reconsider their decision the Regional Stakeholder Group has not recommended a Marine Conservation Zone in Morecambe Bay to protect broadscale habitats and FOCI that exist but are not designated in the Special Area of Conservation. This prevents achievement of some of the representativity and replication targets.
- 8.4.3. No summary is provided of the extent to which the requirements of the ENG for Reference Areas have been met. Fourteen recommended Reference Areas have been identified with seven inshore (bounded at the coast), none of which meet the viability criterion and seven are offshore recommended Reference Areas, with four not meeting the viability criterion.

8.5. Conservation Objectives

- 8.5.1. We accept that the 'best available evidence' has been used in the generation of activity–pressure and pressure–feature matrices within MB0102 Task 3.
- 8.5.2. We consider that it is unsafe to assume that features:
 - 8.5.2.1. will always have been damaged at a location solely as a result of local human activities.

- 8.5.2.2. will be maintained in their current (largely unknown⁷) state provided that there is no increase in the existing anthropogenic pressure to which they are subject, since ecosystems change naturally.
- 8.5.2.3. will recover to some good (but unspecified⁸) state if existing anthropogenic pressures to which they are subject are removed as in some cases damage may have occurred that is irreversible over to timescales much greater than many human generations. Removal of damaging activities is, however, likely to provide many ecological and conservation benefits despite the timescales and trajectory of that recovery being uncertain.
- 8.5.3. Where insufficient information is available at present to define the condition of features for which the Marine Conservation Zone is designated, and given that ecological change is inevitable, the stated goal should not be to return these Zones to an unknown pre-existing state but to mitigate damaging practices within them.
- 8.5.4. We suggest that the evidence which is used to infer pressures should achieve quality and transparency standards similar to those which we expect to be available for defining the ecology.

8.6. Monitoring and Surveillance

- 8.6.1. Surveillance of human activities is essential and monitoring of habitats and species within selected recommended Marine Conservation Zones and recommended Reference Areas is recommended to test presumptions that management activities are being effective.
- 8.6.2. Surveillance in recommended Reference Areas to provide baselines that describe features present and their natural variability should be a priority initially. However, the repercussions and logic of having a Reference Area embedded within a Marine Conservation Zone require hypotheses to be tested rigorously.

⁷ Beyond their existence

⁸ Beyond the reference to 'quality objectives under EU Environmental Directives'

8.6.3. Surveillance of potentially damaging activities in and around recommended Marine Conservation Zones and recommended Reference Areas should be undertaken as a means of increasing the science base on which are based future assumptions of the ‘activity-pressures-unacceptable adverse impact’ sequence.

8.7. Uncertainty and Risk

8.7.1. There is some evidence that the essence of the rationale for the ENG targets and ranges has not been understood and reflected in the Final Recommendations. Specifically, the idea that a range is a measure of uncertainty does not seem to have been factored into decision making. The choice of the minimum of a range generally carries more risk that the objective of the target will not be achieved than if the maximum is chosen. However, it appears that, where there is choice, the minimum has become the target for the Final Recommendations.

8.7.2. We understand that socio-economic pressures have resulted in Recommendations to protect subtidal mud (A5.3) that fall below the minimum adequacy requirement in the Net Gain and ISCZ regions. Significant risks are being run that protection of the species and biotopes which depend upon this broadscale habit will be less than adequate.

8.7.3. None of the Regional Projects have acknowledged or appear to have used the guidance on the recommended average size of recommended Marine Conservation Zones and recommended Reference Areas of 10 to 20 km diameter. That is to deny the wide range of movement and dispersal distance of some species and the need to have a range of Marine Protected Area sizes to afford protection for them.

8.8. Reference Areas

8.8.1. Regional Projects and their Regional Stakeholder Groups have failed to meet important requirements of the ENG to identify a complete set

8.8.2. The failure to identify a complete set of viable Reference Areas is an unsatisfactory state of affairs which will require Defra and the SNCBs to return to the design of the Reference Area network with a view to expanding the recommended Reference Areas in accordance with the Ecological Network Guidance.

9. References

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Annex 1

Protocol for the development of the MPA SAP's advice to Defra on the Regional Projects' Final Recommendations for MCZ networks

Objectives

The Government expectations of the SAP are to provide:

1. An independent assessment of the extent to which the recommendations of the Regional Projects meet the requirements of the ENG for an ecologically-coherent network.
2. A discussion of the evidence used to support the recommended MCZs and draft conservation objectives, including the scientific certainty of recommended MCZs and draft conservation objectives.
3. Draft and final advice to the SNCBs and Defra by 17th October by 17th and 31st October respectively.

The SAP's Terms of Reference require it to:

- observe the highest standards of impartiality, integrity and objectivity in relation to the advice and information they provide;
- be accountable to the Secretary of State and the public more generally for its activities and for the standard of advice it provides; and
- in accordance with Government policy on openness, comply fully with the code of practice on Access to Government Information.

Protocol for the development of past advice

1. Since their appointment, SAP members have developed advice based on reports, proposals and recommendations provided by the SNCBs and regional projects and their own scientific knowledge and understanding. Delivered advice has always represented the consensus of the Panel as a whole.
2. The SAP was able to review the ENG during its preparation and has acknowledged the guidance it, and subsequent material issued by the SNCBs after peer review, as the authoritative statement of technical requirements for an ecological coherent network of MPAs in the Secretary of State waters.
3. The SAP has reviewed and offered advice, within its competence, upon:
 - 3.1. The Regional Profiles (i.e. sources of environmental and socioeconomic data) as they existed at the end of April 2010;
 - 3.2. The 3 iterative reports of the Regional Projects' emerging ideas and proposals for MCZs based on the ENG guidelines, further guidance from the SNCBs, developing Regional Profiles and deliberations of the RSGs.
 - 3.3. The draft Final Recommendations.

4. In all cases, the Regional Projects made their Reports available to SAP members and made presentations of them to a meeting of the whole SAP a few days later. Observers were accepted at these meetings. Four members of the SAP each took the lead in developing an initial response to one of the Regional Project reports and presented these to a plenary meeting of the SAP, typically a week later. The outline of a draft response to each Regional Report was developed at the meeting; inevitably some of the comments and advice were common to all. No observers were permitted at these meetings to allow an unconstrained scientific discussion but minutes were published. Subsequently consensus reports were developed by email, under the responsibility of the chairman.

Protocol for the achievement of the Government's expectations of the SAP

1. The Final Recommendations were delivered to the SNCBs and SAP on 8th September. A two-day meeting of the SAP is scheduled for 15th and 16th September. On this occasion, in recognition of the volume of the material, pairs of members of the SAP have agreed to prepare and present initial reviews of the four Regional recommendations on the 15th. Drafting of the SAPs advice will begin on the 16th and continue by email subsequently to achieve consensus advice.
2. The assessment of the extent to which the individual regional recommendations meet the totality of the ENG guidelines and supplementary guidance will be in the form of an exception report, focussed upon any shortfalls and their implications for the achievement of ecological coherence regionally and in the SoS waters as a whole. Recommendations for action by the SNCBs and Defra will be considered.
3. SAP member's knowledge of the plans/aspirations of the devolved administrations and a visit to Edinburgh to meet the Director of Marine Scotland will be used to determine whether a view can be taken on the achievement of ecological coherent network of MPAs in UK waters.
4. The assessment of evidence used to support the recommended MCZs and draft Conservation Objectives will be based on the descriptive text and references cited by the Regional Projects in their Reports, augmented by the SAP's knowledge of the data made available by the SNCBs and applicable scientific and grey literature. It is likely that this will comprise some general comments and any specific deficiencies at site level that are identified.