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Marine Scotland

Assessment of the Fair Isle Third Party Demonstration and Research MPA Proposal - Criteria and Socio-economic Final Report

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Summary

Background

In October, 2014, ABPmer, supported by eftec and Cefas was appointed by Marine Scotland to carry out a full assessment of a third-party Demonstration and Research (D&R) proposal for a Marine Protected Area (MPA) around Fair Isle together with an assessment of the possible socio-economic impacts of the designation.

The Fair Isle third-party D&R MPA was proposed by stakeholders during the process of developing Scottish MPA submitted by the Fair Isle Marine Environment and Tourism Initiative (FIMETI) and is assessed in this study. This work will contribute to developing a network of Marine Protected Areas for Scotland's seas by reviewing the validity of the proposed site as a D&R MPA.

Marine Scotland has published assessment guidelines for D&R MPA proposals (Marine Scotland, 2011). There are six criteria against which proposals are to be assessed:

- The aims and objectives proposed for the MPA are feasible;
- The proposed MPA is the best means of carrying out the proposed demonstration;
- Research proposed is scientifically sound;
- There is a good level of support from stakeholders;
- The proposed demonstration is feasible and fits within the wider set of government priorities at the national level; and
- The proposed demonstration has a high value in terms of helping to improve our knowledge and understanding.

Aims of Study

The aim of the study was to provide a full assessment of the Fair Isle proposal, as submitted by FIMETI (Riddiford & Riddiford, 2011, 2014 and 2015), using the MPA Guidelines and an investigation into the possible socio-economic impacts of the designation if it was to go ahead.

The specific objectives of this study were to:

- Identify whether the research and/or demonstration approaches that have been proposed fulfil the requirements in the MPA Selection Guidelines;
- Identify the scientific, socio-economic and environmental impacts of designation of each D&R MPA;
Identify any potential negative impact, and highlight the potential benefits to the environment of each designation;

Identify any potential negative impact, and also highlight the potential benefits, to planned and existing activity, as well as to local communities in and around the area of designation;

Consider whether the designation of an MPA would cause displacement of activity;

Consider assessment of costs with particular regard to:
- Where for example, marine users alter their operations to mitigate impacts that they have on features protected by MPAs;
- The increased costs that are likely to be incurred by operators in undertaking the environmental assessments that accompany future licence applications;
- Costs of monitoring and enforcing management of the sites; and
- Costs of the monitoring programme that will assess the outputs of the D&R project.

Consider the benefits with particular regard to:
- Anticipated benefits of the site;
- Qualitative assessment of benefits of individual sites to ecosystem services and marine management;
- Qualitative assessment of the potential benefits to recreation and tourism; and
- Information provided by stakeholders on potential benefits to people in general.

Highlight current research and areas where further research and development is required to fill key knowledge gaps.

Conclusions

The Fair Isle proposal has a number of strengths in that it builds on an established research and demonstration base and has strong support from the local community and the majority of wider stakeholders. The proposal does not identify specific management measures at this stage but rather presents an inclusive mechanism by which potential management measures will be identified and agreed with relevant stakeholders. The proposal includes detailed arrangements for a governance structure which would include the formation of a Steering Committee. It is anticipated that this Committee would comprise of a range of relevant parties who have an interest in Fair Isle and the local Shetland communities together with representatives at a national scale.

While the proposal could result in the collection of useful information on the relationship between seabirds, prey and climate change, given the low level of current pressure from commercial fishing it is unclear the extent to which local management measures might provide significant benefit to SPA birds. Nevertheless, designation of the MPA would provide an opportunity to implement measures should these be required.
Compliance with the MPA selection criteria has for the main part been achieved. While no specific management measures have been identified, there is a clear process for specifying and agreeing management measures where the need is identified. The costs and benefits of implementing the R&D MPA at Fair Isle will be small. The proposal has the backing of both Fair Isle and wider Shetland communities and the studies undertaken within the R&D MPA will be implemented through societal choice.
Abbreviations

ABPmer  ABP Marine Environmental Research Ltd
AIS     Automatic Identification System
BRIA    Business and Regulatory Impact Assessments
Cefas   Centre for the Environment, Fisheries and Aquaculture Science
D&R     Demonstration and Research
Defra   Department for the Environment, Food and Rural Affairs
FCI     Food Certification International Ltd
FIBO    Fair Isle Bird Observatory
FICA    Fair Isle Community Association
FIMETI  Fair Isle Marine Environment and Tourism Initiative
GeMs    Geodatabase of Marine features in Scotland
GIS     Geographic Information System
GVA     Gross Value Added
HLMO    High Level Marine Objective
IA      Impact Assessment
ICES    International Council for the Exploration of the Seas
m       million
MMO     Marine Management Organisation
MPA     Marine Protected Area
NAFC    North Atlantic Fisheries College
NEA     National Ecosystem Assessment
NMPi    National Marine Plan interactive
RSPB    Royal Society for the Protection of Birds
SFA     Shetland Fishermen’s Association
SFF     Shetland Fishermen’s Federation
SIC     Shetland Islands Council
SNH     Scottish Natural Heritage
SPA     Special Protection Area
SSMO    Shetland Shellfish Management Organisation
UK      United Kingdom
WWII    Second World War

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1. Introduction

In October, 2014, ABPmer, supported by eftec and Cefas was appointed by Marine Scotland to carry out a full assessment of the Fair Isle third-party Demonstration and Research (D&R) Marine Protected Area (MPA) proposal together with an assessment of the possible socio-economic impacts of the designation.

1.1 Background

The Marine & Coastal Access Act 2009 and Marine (Scotland) Act 2010 provide for the designation of Marine Protected Areas (MPAs) within Scottish inshore and offshore waters. This includes provision for the designation of Demonstration & Research (D&R) MPAs under section 67 of the Marine (Scotland) Act for the purpose of demonstrating, or carrying out research on sustainable methods of marine management or exploitation in territorial waters. The Scottish Government recently designated 30 Nature Conservation MPAs under these Acts and is now considering the case for designating additional D&R MPAs in inshore waters under the Marine (Scotland) Act 2010.

The Fair Isle third-party D&R MPA was proposed by stakeholders during the process of developing Scottish MPA submitted by the Fair Isle Marine Environment and Tourism Initiative (FIMETI) and is assessed in this study. This work will contribute to developing a network of Marine Protected Areas for Scotland’s seas by reviewing the validity of the proposed sites as D&R MPAs. The work is also seen as a high policy priority in light of consideration of the Marine (Scotland) Act where the Cabinet Secretary undertook to designate MPAs in Scottish territorial waters in order to protect marine biodiversity and geodiversity and contribute to a UK and international network of MPAs.

Marine Scotland has published assessment guidelines for D&R MPA proposals (Marine Scotland, 2011). There are six criteria against which proposals are to be assessed:

- The aims and objectives proposed for the MPA are feasible;
- The proposed MPA is the best means of carrying out the proposed demonstration;
- Research proposed is scientifically sound;
- There is a good level of support from stakeholders;
- The proposed demonstration is feasible and fits within the wider set of government priorities at the national level; and
- The proposed demonstration has a high value in terms of helping to improve our knowledge and understanding.
1.2 Study Aims and Objectives

The aim of the study was to provide a full assessment of the Fair Isle proposal as submitted by FIMETI (Riddiford & Riddiford, 2011, 2014 and 2015) see Image 1 using the MPA Guidelines and an investigation into the possible socio-economic impacts of the designations if it was to go ahead.

The specific objectives of this study were to:

▪ Identify whether the research and/or demonstrated approaches that have been proposed fulfil the requirements in the MPA Selection Guidelines;
▪ Identify the scientific, socio-economic and environmental impacts of designation of each D&R MPA;
▪ Identify any potential negative impact, and highlight the potential benefits to the environment of each designation;
▪ Identify any potential negative impact, and also highlight the potential benefits, to planned and existing activity, as well as to local communities in and around the area of designation;
▪ Consider whether the designation of an MPA would cause displacement of activity;
▪ Consider assessment of costs with particular regard to:
  - Where for example, marine users alter their operations to mitigate impacts that they have on features protected by MPAs;
  - The increased costs that are likely to be incurred by operators in undertaking the environmental assessments that accompany future licence applications;
  - Costs of monitoring and enforcing management of the sites; and
  - Costs of the monitoring programme that will assess the outputs of the D&R project.
▪ Consider the benefits with particular regard to:
  - Anticipated benefits of the site;
  - Qualitative assessment of benefits of individual sites to ecosystem services and marine management;
  - Qualitative assessment of the potential benefits to recreation and tourism; and
  - Information provided by stakeholders on potential benefits to people in general.
▪ Highlight current research and areas where further research and development is required to fill key knowledge gaps.
Image 1. Location of Fair Isle Demonstration and Research MPA
1.3 Structure of Report

The report is structured as follows:

Section 1: Introduction - this section;

Section 2: Methodology;

Section 3: Socio-economic Assessment and Assessment against Criteria; and

Section 4: References.

2. Methodology

2.1 Introduction

The study comprised a desk based review supplemented by consultation with relevant stakeholders. The methodology was centred around the following tasks:

▪ Task 1 - Collation and Preparation of Baseline Information;
▪ Task 2 - Clarification of Third-party D&R MPA Proposals;
▪ Task 3 - Assessment of Proposals against MPA Selection Criteria; and
▪ Task 4 - Socio-economic Assessment.

2.2 Task 1 - Collation and Preparation of Baseline Information

Available data and information have been collated to both inform the evaluation against the D&R MPA assessment criteria and to support the socio-economic assessment.

Given that both assessments relate to changes in impacts over time, a dynamic baseline has been constructed which indicates how conditions might change over the time period of the assessment. For the purposes of this study, the assessment period has been set as 2015 to 2034. The Green Book indicates that ‘Costs and benefits considered should normally be extended to cover the period of the useful lifetime of the assets encompassed by the options under consideration’. As the environmental assets are effectively presented in perpetuity, a practical time period of 20 years has been selected for the study on the basis that this provides sufficient time for recovery of biodiversity features and that costs and benefits beyond this time period will be heavily discounted and thus will not particularly influence the overall costs and benefits.
2.2.1 Data and Information Requirements

Evaluation against assessment criteria

To inform the evaluation against the assessment criteria, information has been gathered on the following:

- Details on the D&R MPA proposal particularly including proposed management measures and spatial application of management measures, including any clarifications;
- Spatial data on the distribution of biodiversity and geodiversity features within and adjacent to the proposed D&R MPA site; and
- Information on the current state of these features (as a result of existing human activity pressures) and how this might change over the assessment period in the absence of any D&R MPA designation.

Socio-economic assessment

The types of information gathered to inform the socio-economic assessment have included:

- Spatial data on the distribution of biodiversity and geodiversity features within and adjacent to the proposed D&R MPA sites and how this might change over the assessment period;
- Spatial data on the distribution and intensity of relevant human activities within and adjacent to the proposed D&R MPA site and how this might change over the assessment period;
- Data on the economic value of relevant human activities and how this might change over the assessment period; and
- Data on the types of ecosystem services and their levels in the proposed site, and evidence on the value of the benefits people derive from these marine ecosystem services in the proposed D&R MPA site and how these values might change over the assessment period.

2.2.2 Sources of Data and Information

The project has made use of the following sources of information in taking forward the evaluation against the assessment criteria and the socio-economic assessment.

Information on biodiversity and geodiversity features

Information on the distribution of biodiversity and geodiversity features has been collated within ArcGIS, based on the following sources:
SNH's GEMS database (biodiversity and geodiversity database);
Marine Scotland’s NMP interactive;
Atlantic MESH habitat map;
Relevant data collected as part of Defra project MB0102 (MPA data layers);
Data collected for the Shetland Marine Plan; and
Data presented within the Fair Isle D&R MPA proposal (Riddiford &
Riddiford, 2011).

These data sources were used to develop a best understanding of the spatial
distribution of biodiversity and geodiversity features within and adjacent to the
proposed D&R MPA site. The biodiversity information included all biodiversity
features and not just those for which NC MPAs might be designated, as D&R
MPAs can be designated for reasons other than the presence of NC MPA
features.

Habitat and species layers have been created within ArcGIS and have been
used to inform the assessment of the environmental impact of management
measures proposed for the D&R MPA.

Information on human activities

Data on the spatial distribution and intensity of marine activities occurring
within and adjacent to the proposed D&R MPA site has been collated within
ArcGIS. This included information on the following activities:

- Aquaculture (finfish and shellfish);
- Aviation;
- Carbon Capture and Storage;
- Coast Protection and Flood Defence;
- Commercial Fisheries (including salmon and sea trout);
- Energy Generation;
- Military Interests;
- Oil and Gas (including exploration, production, interconnectors, gas
  storage);
- Ports and Harbours;
- Power Interconnectors;
- Recreational Boating;
- Shipping;
- Social Impacts;
- Telecom Cables;
- Tourism (including heritage assets);
- Waste Disposal (aquatic discharges and dredge material disposal); and
- Water Sports.

The D&R MPA proposal primarily sought to monitor the impact of fisheries
management measures.
Key sources of information used include:

- Marine Scotland’s NMPl Database;
- Oceanwise data (Marine FIND);
- Scotland’s Marine Atlas (Baxter et al, 2011);
- The Marine Atlas that informed the development of the Shetland Marine Plan;
- ICES rectangle data for <15m commercial fishing vessels from Marine Scotland;
- VMS ping data for UK commercial fishing vessels (>15m) from Marine Scotland;
- Scotmap data (mapping of distribution of effort by under 15m vessels in Scottish waters);
- Surveillance data for fisheries; and
- MMO AIS Shipping Data (MMO, 2014).

Possible changes in the distribution and intensity of human activity over the time period of the assessment have been considered to provide a dynamic baseline. This work has drawn on previous work to develop a dynamic baseline for the impact assessment prepared to inform the designation of Scottish Nature Conservation MPAs (Marine Scotland, 2013).

This information, together with that on the proposed management measures for the D&R MPA proposal, was used to undertake an initial scoping exercise which was done by carrying out a spatial analysis using available spatial data to identify the potential for any management measures proposed for the D&R MPA to affect human activities.

For those marine activities that could be potentially affected as a result of implementation of management measures within the proposed D&R MPA, baseline information on the economic value of those activities and how this might change over the assessment period have been collected. General information on the economic value of marine activities has been taken from Scotland’s Marine Atlas (Baxter et al, 2011) and the impact assessment prepared to inform the designation of Scottish Nature Conservation MPAs (Marine Scotland, 2013).

**Information on marine ecosystem services**

Information on marine ecosystem services has been drawn from previous work for the impact assessment prepared to inform the designation of Scottish Nature Conservation MPAs (Marine Scotland, 2013), from the National Ecosystem Assessment Follow-on Project (UK NEA, 2014) and from a study by eftec et al (in prep) on the valuation of benthic ecosystem services in UK waters.
2.3 Task 2 - Clarification of Third-party D&R MPA Proposals

The Scottish MPA Selection Guidelines (Marine Scotland, 2011) set out the selection criteria for D&R MPA proposals, including third-party D&R MPA proposals. In particular, Table 6 of Appendix 2 sets out the factors to be addressed by D&R MPA proposals (reproduced in Table 1 below).

An initial review of the D&R proposal indicated that further clarification and development of the proposal was likely to be required, particularly in relation to possible management measures and monitoring arrangements. The project team has worked with the proposal promoters and relevant stakeholders to clarify the proposal. This included site visits to meet with the proposal promoters and relevant stakeholders as well as informal communication by phone and email.

The proposal has been clarified through an iterative process of discussion during the study which has assisted in testing the extent to which the proposals meet the assessment guidelines. Where information remains lacking, rather than simply adopting pass/fail criteria, we have, as appropriate, identified what actions might be taken to strengthen a proposal so that it might better meet the assessment guidelines.

The further development/clarification of the D&R MPA proposal has been documented in the Section 3 and Appendix B and has been taken into account in preparing the assessment against the MPA selection guidelines and in the socio-economic assessment. The engagement process with proposal proponents and relevant stakeholders has also helped to test the proposals against the assessment guidelines and thus inform the assessment under Task 3 (see section 2.4).

2.4 Task 3 - Assessment of Proposals Against MPA Selection Criteria

Table 7 of Appendix 2 of the Scottish MPA Selection Guidelines (Marine Scotland, 2011) sets out the assessment guidelines for D&R MPA proposals, including third-party D&R MPA proposals (reproduced in Table 2 below).

The evaluation criteria provided in Table 7 of the MPA Selection Guidelines are largely qualitative and have therefore required a level of judgement to be applied in determining the extent to which the criteria are met. For reasons of transparency, the evidence in relation to each of the criteria has been collated and clearly demonstrated as to how it has been used in coming to conclusions on the adequacy of each D&R MPA proposal. The findings of the assessment have been recorded in a reporting template (Appendix B3).
Where it has not possible to obtain sufficient clarity resulting in some uncertainty concerning the extent to which individual criteria may or may not be met, this has been reflected in the evaluation.

**Table 1. Factors to be addressed by Marine Scotland and/or third parties when preparing Demonstration & Research MPA proposals**

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<tr>
<td>1. <strong>What is the purpose of the proposed MPA?</strong></td>
<td>The proposal must clearly define what the purpose of the proposed MPA is. Proposals must relate to the demonstration of sustainable methods of marine management or exploitation, or carrying out research into such matters. They do not have to relate to MPA search features. The purpose should be specific to the proposed MPA in terms of its location, size and the features it contains. The aims and objectives of the proposed MPA should be specific and realistic in terms of what the MPA is likely to achieve and the outcome must be measurable.</td>
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<td>2. <strong>What is novel about the proposed MPA?</strong></td>
<td>Novelty will be an important consideration and therefore proposals should demonstrate what is novel about the proposed MPA. ‘Novelty’ can refer to either a new approach or technique, or a new application of an established process. For example this could include developing new ways of working/management approaches, and/or addressing issues through original research. Some Demonstration MPAs may involve trialling approaches that have been developed elsewhere to determine their applicability in new situations in Scotland.</td>
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| 3. **What are the benefits of the proposed MPA?** | The proposal should describe:  
  - The potential benefits likely to arise directly from the proposed MPA, e.g. to the marine environment within the MPA, to people living and working within or close to the MPA;  
  - The potential indirect benefits, e.g. how the lessons learnt from this demonstration project might be applied more widely; and  
  - The potential contribution that the proposed MPA will make to Scotland’s national marine objectives. |
| 4. **Why is a Demonstration MPA the right approach?** | The proposal should explain what other measures have been considered that could be put in place to achieve the proposed purpose. Alternatives should be evaluated critically so that it is clear why a Demonstration MPA is considered to be the most appropriate approach. Other measures which might have been considered as options include sectoral measures (e.g. fisheries measures), and voluntary agreements. A proposal should also explain why the demonstration or research could not be undertaken in a MPA designated for Nature Conservation purposes. |

(Source: Table 6 from Marine Scotland, 2011)
Table 2. Assessment guidelines for Marine Scotland or third party proposals for Demonstration & Research MPAs

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<td>1. The aims and objectives proposed for the MPA are feasible.</td>
<td>To include assessment of whether the size and location of the proposed MPA are appropriate for achievement of the proposed aims and objectives.</td>
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<tr>
<td>2. The proposed MPA is the best means of carrying out the proposed demonstration.</td>
<td>Assessment to include consideration of the application of research and the potential for any proposed management measures to be successfully implemented.</td>
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<tr>
<td>3. Research proposed is scientifically sound.</td>
<td>Assessment of scientific rigour undertaken by Marine Scotland Science or statutory advisors.</td>
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<td>4. There is a good level of support from stakeholders.</td>
<td>Support would be expected from those most directly involved/affected by the proposal.</td>
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<td>5. The proposed demonstration is feasible and fits within the wider set of government priorities at the national level.</td>
<td>This could include contributing to achieving one or more of Scotland’s National Marine Objectives. The proposal should be able to demonstrate a good fit with the wider set of government priorities at the national level.</td>
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<td>6. The proposed demonstration has a high value in terms of helping to improve our knowledge and understanding.</td>
<td>This may be in terms of the interaction between new technology and marine features or the trialling of novel approaches to management.</td>
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(Source: Table 7 from Marine Scotland, 2011)

2.4.1 Criterion 1 - The Aims and Objectives Proposed for the D&R MPA are Feasible

This assessment has considered whether the aims and objectives are appropriate and feasible, including whether the size and location of the proposed MPAs are appropriate for achieving the proposed aims and objectives.

Relevant sub criteria have included:

- Do the aims and objectives relate to the demonstration of sustainable methods of marine management or exploitation, or to carrying out research into such matters?
- Are the aims and objectives clearly specified, and are they appropriate, realistic and feasible (for the size, location and features of the proposed D&R MPA)?
- Does the D&R MPA include the relevant area over which management measures might be required to achieve the proposed aims and objectives?
- Are governance arrangements for the D&R MPA clear?
2.4.2 Criterion 2 - The Proposed D&R MPA is the Best Means of Carrying Out the Proposed Demonstration

The assessment included consideration of the application of the research and the potential for any proposed management measures to be successfully implemented.

Relevant sub criteria have included:

- Are the aims and objectives appropriate to be pursued through designation as a D&R MPA? (i.e. the objectives cannot be better achieved through other mechanisms/processes, such as voluntary arrangements, sectoral measures e.g. for fisheries, or a Nature Conservation MPA);
- Does the proposal involve development of a new approach or technique, or a new application of an established process (e.g. new ways of working, new management approaches, addressing issues through original research, trialling approaches from elsewhere to determine their applicability in Scotland)?;
- Is there good potential for the proposed management measures to be successfully implemented? i.e. is there likely to be good compliance, are enforcement mechanisms available/in place/described/budgeted for/possible to develop?;
- Are the impacts of the proposed management measures acceptable? (consideration of environmental, social and economic costs and benefits);
- Could the proposal be modified to increase benefits/reduce costs while still meeting its aims and objectives?

2.4.3 Criterion 3 - Research Proposed is Scientifically Sound

The assessment considered the scientific rigour of the proposals.

Relevant sub criteria have included:

- Is a clear research hypothesis stated?
- Are the management measures clearly defined?
- Is the research likely to result in meaningful and measurable outcomes?
- Are appropriate monitoring arrangements proposed?
- Is baseline monitoring in place against which to monitor the impact of the designations and proposed management measures?
- What arrangements are in place for dissemination of research findings?
In relation to this criterion, work has been undertaken to understand the potential impact of proposed management measures on relevant biodiversity and geodiversity features as there is an implicit assumption that these changes will be measurable and thus the D&R MPA proposal will be able to demonstrate the impact of these changes.

2.4.4 Criterion 4 - There is a Good Level of Support from Stakeholders

The assessment has evaluated the extent to which the proposal is supported by those most directly involved/affected by the proposal. It was taken as given that those proposing the D&R MPA are in support of it. Therefore this criterion has focused on assessing the level of support from other stakeholders that might be affected by or have an interest in the proposal. The analysis has drawn on information from the socio-economic impact assessment in terms of the distribution of impacts to identify those stakeholders that might be most affected by the proposals. We have particularly consulted with these stakeholders to inform the assessment.

Relevant sub-criteria have included:

▪ Are those groups most likely to be negatively impacted by the proposal (identified through the socio-economic assessment) supportive of it (or not vociferously against it)?
▪ Are people living and working within or close to the proposed D&R MPA supportive of it and/or likely to benefit from it?
▪ Are wider stakeholders (e.g. those likely to benefit from wider ecosystem service benefits) supportive of the proposal?

2.4.5 Criterion 5 - The Proposed Demonstration is Feasible and Fits Within the Wider Set of Government Priorities at the National Level

This requirement has been assessed in terms of the contribution to achieving one or more of Scotland’s National Marine Objectives and has identified the additional benefits of the D&R MPA proposal in terms of how they contribute to wider Government objectives. The feasibility of the proposal has been addressed under Criterion 1.

Relevant sub-criteria included:

▪ Does the proposed MPA contribute to achieving one or more of the national marine objectives (see Box 1)?
▪ Is the proposal consistent with wider Scottish national priorities (see Box 1)?
Box 1. **Scottish Government and National Marine Plan Objectives**

Scottish Government strategic objectives most relevant to marine issues are:

- Wealthier and fairer — enabling businesses and people to increase their wealth and more people to share fairly in that wealth; and
- Greener — improving Scotland’s natural and built environment and the sustainable use and enjoyment of it.

The strategic objectives of Scotland’s National Marine Plan and the relevant High Level Marine Objectives (HLMOs) are:

**Achieving a sustainable marine economy:**

- Infrastructure is in place to support and promote safe, profitable and efficient marine businesses (HLMO 1);
- The marine environment and its resources are used to maximise sustainable activity, prosperity and opportunities for all, now and in the future (HLMO 2);
- Marine businesses are taking long-term strategic decisions and managing risks effectively. They are competitive and operating efficiently (HLMO 3);
- Marine businesses are acting in a way which respects environmental limits and is socially responsible. This is rewarded in the marketplace (HLMO 4).

** Ensuring a strong, healthy and just society:**

- People appreciate the diversity of the marine environment, its seascapes, its natural and cultural heritage and its resources and act responsibly (HLMO 5);
- The use of the marine environment is benefiting society as a whole, contributing to resilient and cohesive communities that can adapt to coastal erosion and flood risk, as well as contributing to physical and mental wellbeing (HLMO 6);
- The coast, seas, oceans and their resources are safe to use (HLMO 7);
- The marine environment plays an important role in mitigating climate change (HLMO 8);
- There is equitable access for those who want to use and enjoy the coast, seas and their wide range of resources and assets and recognition that for some island and peripheral communities the sea plays a significant role in their community (HLMO 9);
- Use of the marine environment will recognise, and integrate with, defence priorities, including the strengthening of international peace and stability and the defence of the United Kingdom and its interests (HLMO 10).
Living within environmental limits:
- Biodiversity is protected, conserved and, where appropriate, recovered, and loss has been halted (HLMO 11);
- Healthy marine and coastal habitats occur across their natural range and are able to support strong, biodiverse biological communities and the functioning of healthy, resilient and adaptable marine ecosystems (HLMO 12);
- Our oceans support viable populations of representative, rare, vulnerable and valued species (HLMO 13).

Promoting good governance:
- All those who have a stake in the marine environment have an input into associated decision-making (HLMO 14);
- Marine, land and water management mechanisms are responsive and work effectively together for example through integrated coastal zone management and river basin management plans (HLMO 15);
- Marine management in the UK takes account of different management systems that are in place because of administrative, political or international boundaries. (HLMO 16);
- Marine businesses are subject to clear, timely, proportionate and, where appropriate, plan-led regulation (HLMO 17);
- The use of the marine environment is spatially planned where appropriate and based on an ecosystems approach which takes account of climate change and recognises the protection and management needs of marine cultural heritage according to its significance (HLMO 18).

Using sound science responsibly:
- Our understanding of the marine environment continues to develop through new scientific and socio-economic research and data collection (HLMO 19);
- Sound evidence and monitoring underpins effective marine management and policy development (HLMO 20);
- The precautionary principle is applied consistently in accordance with the UK Government and Devolved Administrations’ sustainable development policy (HLMO 21).

2.4.6 Criterion 6 - The Proposed Demonstration has a High Value in Terms of Helping to Improve our Knowledge and Understanding

The extent to which the D&R MPA proposal will lead to improvements in knowledge and understanding are significantly related to the scientific merit of the proposals. In particular, it is important that there are clear objectives underpinning the proposals, appropriate monitoring and dissemination arrangements. These aspects are assessed under Criterion 3. This Criterion
has therefore focused on how the proposal addresses key knowledge gaps and how the lessons may apply more widely.

Relevant sub-criteria included:

▪ Does the proposal address a key knowledge gap in sustainable methods of marine management or exploitation, or provide a key trial of a method established elsewhere to determine its applicability in a Scottish context?
▪ Do the lessons learnt from this demonstration proposal have the potential to be applied more widely in Scottish waters?

2.5 Task 5 - Socio-economic Assessment

The socio-economic assessment helps Scottish Ministers both to understand the potential impact of making any D&R MPA designations and in informing the assessment of the proposals against the evaluation criteria (see section 2.4).

For reasons of consistency and clarity a similar approach to the assessment of socio-economic impacts as applied to the assessment of the NC MPAs (Marine Scotland, 2013) has been, with some minor modification, used. This methodology was developed through consultation with MPA stakeholders and successfully informed the designation of 30 NC MPAs. It therefore has a level of acceptance amongst stakeholders. It is consistent with the Green Book Methodology (HM Treasury, 2011) and Scottish Government requirements for Business and Regulatory Impact Assessments (BRIAs).

The socio-economic assessment has considered the following impacts:

▪ Economic impacts (costs and benefits) to marine activities:
  - Loss or displacement of current (or future) economic activity;
  - Increased operating costs of economic activity; and
  - Benefits to activities (e.g. from enhanced user experience).
▪ Social impacts (costs and benefits) to marine activities:
  - Social impacts arising as a result of impacts on economic activities, where possible, assessed through a distributional analysis of economic impacts.
▪ Costs to the public sector - it is noted that the proponents of the D&R MPAs may take on responsibility for some activities associated with their management but some costs could still be incurred by the public sector (potentially including preparation of statutory instruments, licensing, compliance and enforcement, monitoring costs).
▪ Environmental impacts stemming from designation and associated management measures in terms of beneficial impacts to marine features and changes in ecosystem services provision (including social benefits associated with cultural ecosystem services) and any negative impacts, for example associated with displacement of fishing activity.
2.5.1 Assessment of Economic Impacts to Marine Activities

Where management measures have the potential to significantly affect an existing/future marine activity (either positively or negatively) the impact has been quantified and monetised, where possible. The approach to the assessment of commercial fisheries impacts is presented in Appendix A.

Estimation of Impacts on GVA and Employment

In line with guidance on impact assessment, where any impacts have led to a change in the level of output from an activity, it may also be appropriate to estimate the economic impacts in terms of changes in Gross Value Added (GVA) and employment, depending on the significance of the impact. For example, management measures for commercial fishing activity within an area may result in a loss or displacement of current (and future) output. If there is a decrease in output, then all else being equal, the GVA generated by the fishing sector will fall (this is the direct effect). If the decrease in output reduces this sector’s demand on their suppliers, there will also be knock-on effects on those industries that supply commercial fishing vessels (e.g. diesel suppliers, equipment suppliers, boat manufacturers and repairers and transport providers (resulting in an indirect effect). In addition to impacts on GVA, there could also be impacts on employment. Where required, such impacts can be assessed using Input-Output Tables and Multipliers prepared by national administrations.

Where impacts to GVA and employment are identified, it is also necessary as part of the IA process to assess the distribution of these costs and benefits both in terms of the locations of impact and the particular groups within society that would experience these impacts.

For this study the distributional analysis of economic impacts has focused exclusively on the commercial fishing sector as this is the only sector that is likely to experience any impact to economic output. This analysis has included consideration of the impacts both on specific locations, (e.g. regions, districts and ports) and on specific groups within Scotland’s population (including, for example, different age groups, genders, and parts of Scotland’s income distribution) (see Table 3). Data for larger fishing vessels (over-15m) includes information on the home port and port of landing. This information has been used to identify the likely distribution of impacts on employment (home port) and on the processing sector (port of landing). The data available for under-15m fishing vessels does not identify port of landing or home port. However, since the operating range of these smaller vessels is much more localised, the distribution of potential impacts can be inferred based on the proximity of fishing areas to local fishing ports.
Table 3. Groups who may be affected by economic impacts

<table>
<thead>
<tr>
<th>Location</th>
<th>Groups Distinguished By</th>
<th>Fishing Group</th>
<th>Income</th>
<th>Minority</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region Port Rural/ urban/ coastal and island</td>
<td>Children Working age Pensionable age</td>
<td>Male Female</td>
<td>Gear type Vessels type Species type</td>
<td>10% most deprived 10% most affluent Remaining 80%</td>
<td>Crofters 10% most deprived 10% most affluent 10% most affluent Ethnic minorities Religion Sexual orientation</td>
</tr>
</tbody>
</table>

2.5.2 Assessment of Social Impacts

Social impacts are effects on individuals, communities and society and can be considered to encompass both market and non-market (i.e. social and environmental) goods and services. There is no single definition of what social impacts are, and no single list that characterises them.

For the purpose of this study, the following categorisation of social impacts has been adapted from Marine Scotland (2013), based on areas of social impact initially identified by the GES/GSR Social Impacts Taskforce (Defra, 2011):

- Access to services;
- Culture and Heritage;
- Income and employment;
- Crime;
- Education;
- Environment; and
- Health.

Potentially significant social impacts may arise in a number of different ways. For example, impacts on activities may give rise to social impacts where the activity of itself provides a social benefit (e.g. recreation or tourism). Where an impact on an activity affects economic output (and thus affects income and employment), this could also give rise to a significant social impact as income and employment provide important social benefits.

To ensure a consistent approach, the assessment of social impacts (however they may arise) has been made in relation to changes in access to social benefits and changes in the quality of the experience/perception of those benefits as defined in Table 4.
Table 4. Definitions of social impacts

<table>
<thead>
<tr>
<th>Key Area</th>
<th>Access</th>
<th>Experience/Perception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to services</td>
<td>Change in opportunity to use services or time to access services</td>
<td>Change in quality of service provided or received</td>
</tr>
<tr>
<td>Culture and heritage</td>
<td>Change in opportunity to access culture and heritage</td>
<td>Change in quality of cultural or heritage through change in context, quality of visits</td>
</tr>
<tr>
<td></td>
<td>Change in existence of culture/heritage, or knowledge of it (especially loss)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change in number of visits to cultural/heritage sites</td>
<td></td>
</tr>
<tr>
<td>Income and employment</td>
<td>Change in income and employment opportunities</td>
<td>Change in quality of income and employment opportunities</td>
</tr>
<tr>
<td>Crime</td>
<td>Change in opportunity for criminal activities</td>
<td>Change in level of crime (perceived or actual)</td>
</tr>
<tr>
<td>Education</td>
<td>Change in opportunity to access education services</td>
<td>Change in quality of education services</td>
</tr>
<tr>
<td>Environment</td>
<td>Change in opportunity to access environment</td>
<td>Change in quality of environment through change in quality of habitats, species supported or change in quality of visits</td>
</tr>
<tr>
<td></td>
<td>Change in existence of environment, or knowledge of it (especially change in habitats)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change in number of visits to environmental sites</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>Change in level of disease or symptoms (physical and mental health)</td>
<td>Change in self-assessed quality of health</td>
</tr>
</tbody>
</table>

The significance of the social impacts has been assessed using the following definitions:

- **x x x**: significant effect. This is defined as where it is probable that an impact is sufficiently significant so as to be noticed;
- **x x**: possible effect. This is defined as where it is possible that an impact is sufficiently significant so as to be noticed;
- **x**: minimal effect, if any. This is defined as where it is probable than an impact is unlikely to be sufficiently significant so as to be noticeable, but that some possibility exists that a negative impact could occur; and
- **0**: no noticeable effect expected.

Where quantitative information has been available on social impacts, for example, as a result of any distributional analysis of economic impacts, this has been reported.

The distribution of social impacts has been assessed based on the groups identified in Table 3. The distributional analysis has been used the same rating scale as the assessment of significance.
2.5.3 Assessment of Costs to the Public Sector

Given the nature of the D&R MPA proposal, relatively little input is expected to be required from the public sector, beyond attendance at and participation in the Steering Committee by some organisations. Such activity is considered to be part of those organisations normal duties No quantification of public sector costs is therefore considered necessary.

2.5.4 Assessment of Environmental Impacts

The assessment has considered the environmental impacts stemming from designation and associated management measures in terms of beneficial impacts to marine features and changes in ecosystem services provision (including social benefits associated with cultural ecosystem services) and any negative impacts, for example associated with displacement of fishing activity.

The biodiversity and geodiversity features of the proposed D&R MPA contribute to the delivery of a range of ecosystem services. Designation of the D&R MPA and its subsequent management may change the quantity and quality of the ecosystem services provided, which may, in turn, change the value (contribution to economic welfare) of them. Impacts on the value of ecosystem services may occur as a result of the designation, management and/or achievement of the conservation objectives of the D&R MPA.

An analysis has been undertaken to provide a qualitative description of the potential changes in ecosystem services levels associated with the implementation of management measures proposed for the D&R MPA. This has drawn on the work of Bournemouth University and ABPmer (2010) and work to extend that analysis to all relevant Scottish MPA features (Valuing Nature Network (Potts et al, 2013)). The list of final ecosystem services that have been considered is provided in Table 5. The list excludes supporting services to avoid double-counting their impacts in final ecosystem services.

Table 5. List of final Ecosystem Services considered in the assessment

<table>
<thead>
<tr>
<th>General Ecosystem Service Categorisation</th>
<th>Final Ecosystem Services Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisioning</td>
<td>Provision of fish and shellfish for human and non-human consumption</td>
</tr>
<tr>
<td>Cultural</td>
<td>Recreation</td>
</tr>
<tr>
<td></td>
<td>Research and education</td>
</tr>
<tr>
<td></td>
<td>Non-use</td>
</tr>
<tr>
<td>Regulating</td>
<td>Natural hazard protection</td>
</tr>
<tr>
<td></td>
<td>Environmental resilience</td>
</tr>
<tr>
<td></td>
<td>Gas and climate regulation</td>
</tr>
<tr>
<td></td>
<td>Regulation of pollution</td>
</tr>
</tbody>
</table>
In applying economic valuation evidence a link between the management measures to changes in ecosystem services and the economic and social value of these has been identified. The summary has explicitly considered the risk of double-counting between the ecosystem services impacts and the social impacts (e.g. related to cultural value) in the social analysis (see Section 2.5.2). Where an impact was identified under both analyses, the ecosystem services assessment states this and signposts the relevant social analysis.

The use of value transfer, based on Kenter et al (2013), of the benefits that may accrue as a result of the designations has been explored and further information on the approach can be found in Appendix C.

In addition to the summary of anticipated ecosystem service changes, information to clarify the understanding of the qualitative changes in ecosystem services arising from (non-) designation:

**Relevance:** Relating to the amount of ecosystem good or function arising from site;

**Value weighting:** Categorisation of how valuable the amount of ecosystem good or function from the site is in providing benefits to human population;

**Scale of impact:** Consideration of actual potential for impact (for example considering leakage, delivery to human population, etc.); and

**Confidence:** Level of confidence in our current knowledge of all other categories (in other words, scale of benefit, level of improvement, etc.).

Based on the above categories, an overall level of each ecosystem service has been defined with its own confidence level together with an overall level of impact.

The parameters have been assigned a level for each service from a menu, defined as:

**Nil:** Not present/none;

**Minimal:** Present at a very low level, unlikely to be large enough to make a noticeable impact on ecosystem services;

**Low:** Present/detectable, may have a small noticeable impact on ecosystem services, but unlikely to cause a meaningful change to site’s condition;

**Moderate:** Present/detectable, noticeable incremental change to site’s condition; and

**High:** Present/detectable order of magnitude impact on sites condition.
This approach has provided a qualitative summary of the expected ecosystem services benefits to ensure all relevant impacts are captured in the analysis.

3. Socio-economic Assessment and Assessment Against Criteria

3.1 Description of D&R MPA Proposal

FIMETI submitted its original D&R MPA proposal in 2011 (Riddiford & Riddiford, 2011) and has provided further clarification documents in October 2014 (FIMETI, 2014a), November 2014 (FIMETI, 2014b) and June 2015 (FIMETI, 2015). A number of meetings have been held to clarify the proposal and obtain stakeholder feedback on the proposal:

- FIMETI, 29th October 2014;
- SSMO, 30th October 2014;
- SSMO Secretariat, 31st October, 2014;
- SIC, SNH, RSPB, FIBO, 31st October;
- Telephone discussion with SFF, 13th and 24th November 2014;
- SIC, SNH, RSPB and FIMETI, 18 March 2015; and
- SSMO, SFF, FIBO, FIMETI and SNH, 19 March 2015.

Further details of the development of the proposal and discussions at the various stakeholder meetings are provided in Appendix B. A summary of the current proposal is provided below.

3.1.1 Overall Aims and Objectives

The overall aim of the R&D MPA is to demonstrate, through research and dissemination, the effectiveness of a community-led partnership approach in achieving a programme of sustainable measures to help ensure that the marine environment is in a condition that benefits all stakeholders as fully as possible.

To achieve this aim FIMETI (2015), alongside their stakeholders have identified two main objectives for the D&R MPA:

- To investigate the factors affecting seabird populations on Fair Isle, particularly climate change impacts and direct human influences. This will be done through:
  - Studying seabird productivity and prey availability (which will also help expand knowledge on inshore fish and invertebrate populations).
- Exploring the potential for voluntary measures through local management measures in partnership with all stakeholders.
  - To demonstrate the socio-economic benefits of the marine environment and the additional benefits that MPA designation can bring to the community.

In addition FIMETI suggest that the project has wider ‘spin-off’ benefits for Scotland more generally, by way of:

- Exploring a model for collaborative management (co-management) of the marine environment and demonstrating how coastal communities can involve themselves in local management;
- Demonstrating that investing funding and resources into co-managed sites is a sound investment for government departments;
- MPAs are widely viewed as being in place for nature conservation but they can also contribute to the improved management of other interests. Pioneering the D&R model could demonstrate to other interest groups a positive process within which gains are to be made from the establishment of MPAs rather than the usual perception of loss;
- The habitats around Fair Isle are representative of a large number of Northern Isles and coastal Scotland areas so biological results here are likely to be more widely applicable; and
- Fair Isle being used as a potential control site for alien species.

### 3.1.2 Area of R&D MPA

FIMETI (2015, Figure 1 on page 5) confirmed that the proposed boundary for the D&R MPA is as Zone 1 in Table 1 of Riddiford & Riddiford (2011) the original proposal (page 35) comprising a rectangular box, extending 5km offshore (see Image 1).

### 3.1.3 Management Measures

FIMETI (2015) states that the mechanisms by which possible management measures might be implemented will be inclusive and will promote input from all stakeholders. All stakeholders will have an important role to play from the planning through to the implementation process. FIMETI has made clear its wish and intentions for such an inclusive consensual approach. The proposed management measures have therefore not yet been determined and will be agreed on a study by study basis using the governance framework (see Section 3.1.4). In essence, the FIMETI proposal provides a framework within which management measures can be identified and agreed prior to implementation.
3.1.4 Governance

FIMETI (2015) has proposed a governance framework which is designed to assure adequate accountability to the MPA stakeholders and to encourage performance improvement while meeting obligations and legislative requirements. The governance framework sets out the following:

- The mechanisms by which possible management measures might be implemented;
- The structure of governance which the D & R MPA could assume;
- The composition of the suggested executive level including information on the Steering Committee (membership and terms of reference);
- The composition of the suggested management level; and
- The composition of the suggested implementation level.

The governance structure provided the following levels:

- Executive Level: Steering Committee
- Project Management Level: Project Officer Support Team
- Implementation Level: Project Officer (& any technical inputs)

3.1.5 Monitoring

Riddiford & Riddiford (2011) identifies a range of existing long-term monitoring programmes, particularly relating to seabird numbers and breeding success that would inform the assessment of future changes within the D&R MPA. FIMETI (2015) suggested an Implementation Plan with a four phased approach to the research programme through:

- Developing a consensus on the study objectives through initiation and gap analysis;
- Demonstration and Trialling the identified actions;
- Evaluation of the project deliverables against the objectives; and
- Enhancement and maintenance of the future programme.

3.1.6 Dissemination

Riddiford & Riddiford (2011) highlight the dissemination of existing data collected around Fair Isle and suggests this would serve as a platform for dissemination of D&R MPA monitoring data and outputs. FIMETI (2015) states that dissemination will be achieved through various technological and traditional media outlets, such as community and educational involvement, public participation and research publications.
3.1.7 Stakeholder Engagement

Riddiford & Riddiford (2011) document the extensive engagement that has been undertaken in developing the proposal, including with the Fair Isle community, the Shetland Marine Spatial Plan group and fishing interests such as Scottish Fishermen’s Federation (SFF) and Shetland Fishermen’s Association (SFA). Further engagement has taken place during the development of the 2015 submission.

3.2 Socio- Economic Assessment

3.2.1 Baseline Data

Baseline data were collated on human activities, biodiversity and geodiversity features and have been mapped in Appendix B1 and Appendix B2 respectively. The figures in Appendix B1 show the interaction of the human activities, as listed in Section 2.2.2 that occur around Fair Isle and within the D&R MPA boundary, as given in the FIMETI clarification dated 7 November 2014. These show that with the exception of fisheries interests (Figure B1.4) and tourism (Figures B1.13 and B1.14) there was no overlap with other activities that might be affected by the proposed D&R MPA. The scoping results alongside a description of the fisheries baseline and assessment can be found in Appendix B2 (see Tables B2.4 and B2.6 respectively).

Commercial fisheries

In Shetland as a whole, there were 231 full time and 217 part-time fishermen in 2011, with 175 active commercial fishing vessels (Shetland Islands Council & NAFC, 2013). In addition there are over 250 jobs directly supported by the fishing industry including fish processing, transport, marketing, engineering and supply.

Fisheries around Fair Isle in the first half of the twentieth century focussed on saithe, haddock and whiting, and to a lesser extent cod, halibut and flounder, fishing on ‘banks’ to the east, west and south of the island, within 2km of land (Perring, 2013, cited in FIMETI 2014a, outline proposal). After WWII, lobsters became more important locally, and seine netters from distant ports trawled the banks for whitefish through the summer. Whitefish stocks declined during the 1960s and 1970s. In the 1980s, commercial fishing turned to sandeel and there were regularly upwards of 30 boats fishing sandeds around the isle and over 1000 tonnes a week landed in Shetland from Fair Isle waters at the height of the fishery in the mid-1980s (Riddiford & Riddiford, 2011, p19.). However, with overexploitation of these fisheries, the sandeel grounds around Fair Isle (Sandeel Management Area 7) have been closed since 2004.
A Shellfish Regulating Order was established in 1999, managed by the SSMO. Boats operating for shellfish within the designated Order zone have to be licensed by the SSMO, based on a track record of shellfishing in Shetland waters. The renewal of the Shetland Regulated Fishery (Scotland) Act took place during 2012-2013, and a 15-year Regulating Order has been established up to 2028 (FCI, 2014).

In the inshore waters around Fair Isle, there is a fishery for shellfish (crab and lobster), and there are some records of demersal trawl activity (Figure B1.4). The Shetland Marine Spatial Plan indicates some demersal fishing effort around Fair Isle, mainly to the south and east of the island; and shellfish creeling grounds, mainly to the north and east of the island (Shetland Islands Council & NAFC, 2013). Most shellfish fishing takes place inshore, and there are negligible levels of fishing activity outside the Shetland Shellfish Management Area (6nm) (Robinson and Leslie, 2010).

Boats fishing inshore are few and irregular, and the proposed D&R MPA area is not heavily fished at present (FIMETI, 2014a). Members of the SSMO fish in the area although this is seasonal and weather dependent. No information was received regarding fishing activity in the proposed D&R MPA area from SSMO, as it is SSMO policy not to give out spatial information that might identify individual members (SSMO, pers. comm.). Some potting boats from Orkney are permitted to operate in Fair Isle waters under the Regulating Order. The Orkney boats can operate year-round in all weather conditions, setting large numbers of creels in deeper waters and with a longer soak time (Stout & Riddiford, 2001).

The shellfishery has shown declining catch rates. In the 1950s and 1960s, three traditional Fair Isle fishing boats (yoals) operated in the shellfish fishery, which could carry up to 40 creels each. Mean catch rates were around 1 lobster in every 2 creels. In the 1970s, the catch rate was 1 lobster every 3 creels; declining to 1 lobster in every 4 creels in the 1990s, and 1 lobster in every 6 creels in 2000 (Stout & Riddiford, 2001). The fishery mainly takes place during May to September due to weather conditions.

VMS data from 2009-2013 indicate that whitefish trawls, whitefish seines, pelagic trawls, other trawls and dredges (over-15m) operate within the D&R MPA area, including the SPA area (see Table 6). The value of catches over-15m vessels from the total proposed D&R MPA area was £261,823 (of which £135,700 from pelagic trawls; £35,100 from whitefish trawls and seines; and £91,900 from other trawls) (annual average for 2009-2013, 2013 prices). 31 over-15m vessels were recorded fishing within the proposed D&R MPA area over the period 2009-2013, although only 1 vessel (whitefish trawler) fished there regularly (3 or more years during the time period).
Table 6. Volume and value of landings, and number of vessels active, in the proposed D&R MPA and SPA areas, over-15m vessels (annual average, 2009-13; 2013 prices)

<table>
<thead>
<tr>
<th>Element</th>
<th>R&amp;D MPA proposal area (excluding SPA area)</th>
<th>Existing SPA</th>
<th>R&amp;D MPA proposal area (including SPA area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total weight (t)</td>
<td>587.253</td>
<td>63.560</td>
<td>650.813</td>
</tr>
<tr>
<td>Total shellfish value</td>
<td>675.65</td>
<td>210.73</td>
<td>886.38</td>
</tr>
<tr>
<td>Total demersal value</td>
<td>24,023.39</td>
<td>10,351.46</td>
<td>34,374.85</td>
</tr>
<tr>
<td>Total pelagic value</td>
<td>204,482.59</td>
<td>22,079.51</td>
<td>226,562.10</td>
</tr>
<tr>
<td>Total value (£)</td>
<td><strong>229,181.64</strong></td>
<td><strong>32,641.70</strong></td>
<td><strong>261,823.34</strong></td>
</tr>
<tr>
<td>Total no. vessels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fishing</td>
<td>13</td>
<td>18</td>
<td>31</td>
</tr>
<tr>
<td>No. of vessels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fishing 3 or more yrs</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Landings are made predominantly to Norway (Floro 27%; Egersound 27%) and Peterhead (25%) (Table 6). Most vessels have their home port in Lerwick, Shetland, or Fraserburgh (Table 7).

Table 7. Over-15m value of landings from D&R MPA area by port of landing and administration port (annual average, 2009-2013; 2013 prices)

<table>
<thead>
<tr>
<th>Port</th>
<th>Value of Landings (£)</th>
<th>%</th>
<th>Port</th>
<th>Value of Landings (£)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floro</td>
<td>71,905</td>
<td>27.46%</td>
<td>Lerwick</td>
<td>138,734</td>
<td>52.99%</td>
</tr>
<tr>
<td>Egersound</td>
<td>70,973</td>
<td>27.11%</td>
<td>Fraserburgh</td>
<td>85,191</td>
<td>32.54%</td>
</tr>
<tr>
<td>Peterhead</td>
<td>66,070</td>
<td>25.23%</td>
<td>Kirkwall</td>
<td>22,928</td>
<td>8.76%</td>
</tr>
<tr>
<td>Skaagen</td>
<td>23,049</td>
<td>8.80%</td>
<td>Belfast</td>
<td>6,708</td>
<td>2.56%</td>
</tr>
<tr>
<td>Lerwick</td>
<td>10,852</td>
<td>4.14%</td>
<td>Peterhead</td>
<td>3,390</td>
<td>1.29%</td>
</tr>
<tr>
<td>Killybegaes</td>
<td>6,708</td>
<td>2.56%</td>
<td>Plymouth</td>
<td>2,845</td>
<td>1.09%</td>
</tr>
<tr>
<td>Scalloway &amp; Isles</td>
<td>4,765</td>
<td>1.82%</td>
<td>Buckie</td>
<td>1,693</td>
<td>0.65%</td>
</tr>
<tr>
<td>Scrabster</td>
<td>2,924</td>
<td>1.12%</td>
<td>Scrabster</td>
<td>334</td>
<td>0.13%</td>
</tr>
<tr>
<td>Scheveningen</td>
<td>2,845</td>
<td>1.09%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraserburgh</td>
<td>523</td>
<td>0.20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burnmouth</td>
<td>487</td>
<td>0.19%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cullivoe</td>
<td>463</td>
<td>0.18%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yell and Fetlar</td>
<td>260</td>
<td>0.10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td><strong>261,823</strong></td>
<td>100.00%</td>
<td>Grand Total</td>
<td><strong>238,101</strong></td>
<td>100.00%</td>
</tr>
</tbody>
</table>
For under-15m vessels, it is understood from SSMO that only shellfish potting takes place in the area; no information was received regarding other under-15m gears. ScotMap data do not cover the Shetland area. Therefore, area based calculations have been used to estimate the value of landings from the proposed D&R MPA area based on ICES rectangle data. Between £9,500 (under-15m vessels, ICES rectangle landings data pro-rated on an area basis, assuming only shellfish are caught within the MPA and all shellfish landings from ICES rectangles 47E8 and 48E8 derive from the 0-6nm zone as indicated by SSMO) and £43,300 (under-15m vessels, Shetland statistics of the value of crab and lobster landings, applied pro rata to the area of the D&R MPA as a proportion of Shetland 6nm waters). This is likely to be an overestimate as the methodology assumes that all fishing grounds around Shetland and Fair Isle are of equal importance, but in reality the grounds around Shetland are more intensively fished than those around Fair Isle, which are less accessible.

VMS data indicate that there were no non-UK vessels fishing within the proposed D&R MPA. Surveillance data for 2009 to 2013 did not record any sightings of non-UK vessels fishing within the proposed D&R MPA.

The D&R MPA proposal overlaps with the Fair Isle SPA, which extends seawards to 2km. There is a requirement for an SPA management plan.

Tourism

Shetland attracted 64,655 overnight/day visitors in 2012/2013, with 41% being holiday visitors, 41% business visitors and 18% were visiting friends and families. The total spend was £16 million, where holiday makers spent 42% of the total, business visitors 46% with those visiting friends and families spending 12%. The numbers of visitors excluded cruise ship passengers, with cruise visits showing a steady increase from 1988 with 20 arrivals to Lerwick rising to 52 in 2012. There had been a slight decline to 39 visits in 2013 (Shetland Island Council, 2013).

Tourism has been identified as having the greatest potential for growth within the service sector upon which Shetland is increasingly reliant (Shetland Island Council & NAFC, 2013), and increasingly Fair Isle is becoming a significant tourism destination. The Isle is served by a ferry service run by Shetland Islands Council, and a regular plane service. The number of bed nights occupied annually by visitors to Fair Isle Bird Observatory (FIBO) alone has steadily increased year on year and now exceeds 3,000. In addition there is a growing of interest in specialist holidays such as photography courses being run at the FIBO (pers.com. 29/10/2014), see Figure B1.13.

A number of crofts on the island also provide accommodation and the community gains important income (by taxi driving, sale of knitwear, craft and food, etc.) from stay-over visitors together with those from cruise ships and
yachts that visit the island every summer. During the summer months Fair Isle is said to be the second busiest port in Shetland in terms of passenger boat movements.

Tourism is essential to the community on Fair Isle for accommodation outlets, sale of goods (e.g. crafts and knitwear), maintaining the shop as well as sustaining various training programmes (e.g. weaving, spinning and knitwear workshops), etc. For tourists, these are spin-offs from the main attractions that bring them to the Isle, which are its environment and heritage.

Diving is also a main recreational attraction for both staying visitors and day boats, which come from Shetland and Orkney (pers.com 29/10/2014), see Figure B1.14. As noted Fair Isle, attracts and offers a number of tourism opportunities, however it has not been not possible to obtain the costs of these activities.

3.2.2 Assessment

Appendix B2 provides an assessment of the potential costs and benefits of the proposed Fair Isle D&R MPA.

Costs to human activities

The commercial fisheries sector may potentially experience cost impacts depending on the nature of possible future management measures on existing activity. It may also experience costs associated with the management of potential new fisheries activities in the future. As the management measures are not known, it is not possible to quantify any potential economic impacts or consequential social impacts, although such impacts are expected to be minor as the current level of fishing activity is low.

No management measures are proposed for ports and harbours, commercial shipping, recreational boating, water sports or tourism and therefore no additional costs will be experienced by these sectors.

Costs to government

It is not envisaged that there will any substantial costs to the public sector as a result of the proposed designation and management for the R&D MPA. Marine Scotland, Scottish Natural Heritage and Shetland Islands Council are expected to participate in the Steering Committee but participation in such for a is considered to be part of such organisations normal duties.. The proposed site monitoring will, for the most part, be a continuation of that currently undertaken and the dissemination will be mainly through existing channels. Where additional monitoring is carried out this is likely to be on a voluntary basis by local stakeholders.
Benefits

A range of benefits will potentially derive from the designation including:

- Increased recreation/tourism;
- Research and education; and
- Non-use value of natural environment.

Recreation/Tourism

The management measures within the D&R MPA are expected to be minor and thus will not significantly increase the condition or extent of the ecosystem features that attract recreational activity. However, the designation of the D&R MPA may increase the recreational use of the ecosystem by encouraging higher levels of recreation and tourism activity. For example, the numbers of recreational users and tourists visiting Fair Isle may increase as a result of the D&R MPA designation. As a result of this increase in the recreational use of the ecosystem, the value of this ecosystem service is expected to increase.

In addition, an increase in the number of researchers visiting the isle to conduct research studies, may lead to higher occupancy rates of accommodation. However, both the existing infrastructure (limited number of visitor beds) and the relatively short length of the tourist season will limit the potential growth in recreation/tourism. The scale of the impact on ecosystem service provision is assessed as minimal whereas the scale of impact on recreation/tourism activity is assessed as low. The scale of social benefit would also be correspondingly low.

Research and Education

As above, while the management measures within the D&R MPA are expected to be minor and thus will not significantly increase the level of the research and education ecosystem service, the designation of the D&R MPA may increase the use of the ecosystem service by encouraging higher levels of research and education activity - indeed, this is a key objective of the D&R MPA proposal. Both the existing infrastructure (limited number of visitor beds) and the relatively short length of the tourist season will limit the potential for increase in research and education activity. The scale of the impact on ecosystem service provision is assessed as minimal whereas the scale of impact on research and education activity is assessed as low. The scale of social benefit would also be correspondingly low.

Non-use Value of the Natural Environment

Kenter et al (2013) estimated the value of potential marine protected areas in the UK to divers and sea anglers. This analysis covered anglers and divers use values for tourism and leisure activities, and also their non-use values for habitat protection (related to the cultural service from biodiversity existence, and/or supporting services from biologically mediated habitat). For Scotland
the average non-use valuation identified per site by Kenter et al was £5.3-9.5 million. The extent to which an average non-use value might be relevant to Fair Isle is uncertain. On the one hand, its iconic status as an island could mean it has a higher than average value. On the other hand, its remoteness and relatively low numbers of visitors mean it could have a lower than average value. However, Kenter et al (2013) noted that various sites that they could not assess using the travel cost method due to lack of data on visitor numbers, such as Fetlar to Haroldswick (also on Shetland), still had considerable non-use values.

In addition, it is noted that much of the proposed D&R MPA area is already protected as an SPA. Some of the non-use value will therefore already be accounted for by the existing designation. However, the D&R MPA proposal would also afford protection to additional features and over a wider area than the SPA. The D&R MPA designation may also increase the certainty of the value of protection of the site. The extent to which the average non-use value derived by Kenter et al (2013) applies to Fair Isle as a site, and the proportion of this value that would be the result of the D&R MPA designation, are therefore uncertain. Overall the change is assessed as low (low confidence) as ultimately the change in level of service will mainly be related to the effectiveness of the management measures rather than the designation per se and current understanding is that the management measures will be of a minor nature.

Table 8 below provides an overall summary of the estimated costs and benefits of the current Fair Isle D&R MPA proposal and the level of confidence in these assessments.

Table 8. Summary of Fair Isle costs and benefits

<table>
<thead>
<tr>
<th>Costs</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Fisheries - minor unquantified costs (moderate confidence)</td>
<td>Recreation/tourism:</td>
</tr>
<tr>
<td></td>
<td>▪ Increase in level of service assessed as minimal (moderate confidence);</td>
</tr>
<tr>
<td></td>
<td>▪ increase in use of service assessed as low (moderate confidence).</td>
</tr>
<tr>
<td>Research and education:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Increase in level of service assessed as minimal (moderate confidence);</td>
</tr>
<tr>
<td></td>
<td>▪ increase in use of service assessed as low (moderate confidence).</td>
</tr>
<tr>
<td>Non-use value of natural environment - increase in level of service assessed as low (low confidence)</td>
<td></td>
</tr>
</tbody>
</table>

3.3 Assessment Against Criteria

As detailed in Section 2.4, the current proposal has been assessed against the Marine Scotland criteria. The results of this review together with details of
the evidence as provided in the FIMETI proposal/s, and a commentary on the information provided can be found in Appendix B3.

This review has considered all iterations of the proposal together with the outcome of the discussion with the promoters and stakeholders. The outcome of the review highlights the extent to which the proposal meets the criteria or areas where further development of the proposal could improve compliance with the criteria. The outcomes are discussed below against the main criteria headings.

3.3.1 Criterion 1 - The Aims and Objectives Proposed for the MPA are Feasible

Two revised objectives have been proposed for the D&R MPA (FIMETI, 2015). These objectives clearly relate to carrying out research and demonstration activities relating to sustainable management of the marine environment. Although, the headline objectives are fairly broad the proposal provides proposed monitoring arrangements, demonstration activities and a clear basis on which the requirement for management measures will be determined. The proposal provides a clear implementation programme which would ensure that the objectives are appropriate, realistic and feasible.

FIMETI has clarified that the D&R MPA boundary is proposed as Zone 1, identified in Riddiford and Riddiford, (2011). This area has subsequently been renamed the Technical Measures Research Area. The D&R MPA would provide an opportunity to implement management measures within the Technical Measures Research Area outside the SPA. Such measures could provide additional protection to SPA birds and the wider marine environment.

The FIMETI clarification of June 2015 proposed that a governance structure was established with Steering Committee (Executive Level) formed of all relevant bodies and the arrangements of supervision of the Project Officer are clear.

3.3.2 Criterion 2 - The Proposed D&R MPA is the Best Means of Carrying out the Proposed Demonstration

The Fair Isle proposal has a strong demonstration and research component and builds upon established research programmes and good research facilities on the isle. Involvement of the local community in the research programme and the community-led approach to management could both be considered as novel elements of the proposal.

Although the proposed management measures have not yet been defined, other than that they will potentially relate to the commercial fisheries sector, it is proposed that the Steering Committee will agree what they will be through the implementation plan and prior to any studies be commenced.
A key focus of the proposal is on research and demonstration involving the local community. Such a focus could not be achieved through sectoral measures or designation as a NC MPA. A voluntary approach could be pursued, but with increased risk of failure.

The benefits of the Fair Isle proposal are considered to be:

- Strong research baseline exists for marine birds - this is essential in order to be able to detect impact of management measures; and
- Good research facilities available on island.

It is recognised that Fair Isle offers some benefits as a D&R MPA location, particularly in relation to the monitoring of long-term change in sea bird populations and responses to climate change. It is currently unclear what management measures might be implemented and thus the extent to which monitoring might demonstrate the benefit of such measures.

It is recognised that there are other SPAs with marine extensions where management measures might be implemented for which monitoring could be undertaken. There are also other NC MPAs within which fisheries management measures will be implemented for which monitoring programmes could be established. However, it is unlikely that the demonstration and research components of the proposal would be fulfilled at these locations.

Management measures may constrain new fishing opportunities in the future but these will be well recognised at the start of the study and considered accordingly. It is therefore likely that any economic or social cost impacts arising from management measures will be small and that the benefits will also be small.

3.3.3 Criterion 3 - Research Proposed is Scientifically Sound

The purpose of the research is adequately defined. The long history of scientific research and demonstration activities on Fair Isle provide a good foundation on which a D&R MPA could build. The proposal has provided information on the proposed monitoring programmes and has detailed that the management measures will be determined through consensus by the Steering Committee.

Continued long-term monitoring of seabirds will contribute to understanding of changes in seabird populations. The understanding of the causes of change could be enhanced by additional local monitoring of seabird diets and foraging patterns together with information on prey distribution/abundance.
3.3.4 Criterion 4 - There is a Good Level of Support from Stakeholders

The main sector likely to be affected by management measures is commercial fisheries. While this sector is not vociferously opposed to the proposal, they initially had clear concerns about the lack of clarity around management measures and the extent to which the proposal meets the guidelines. These concerns have reduced with the proposal to form a Steering Committee on which fishing interests will have representation and as a result of clarification of the decision making process. The proposed objectives will also assist the fishing industry to extend its knowledge base.

Further work is required particularly to clarify possible management measures and governance arrangements so that commercial fisheries stakeholders can have greater confidence in the proposal.

There is clear support from the Fair Isle community and designation could increase researcher visits and special interest parties, leading to an economic benefit. In addition the community will benefit from the continuation of long term monitoring programmes e.g. that of seabirds, shellfish, meteorology, seashore biodiversity, cetacean sightings. Other benefits will depend on nature of management measures which have not yet been determined.

3.3.5 Criterion 5 - The Proposed Demonstration is Feasible and Fits Within the Wider Set of Government Priorities at the National Level

The proposal would contribute to many of the High Level Marine Objectives (HLMO) including particularly: sustainable use of marine resources (HLMO2), involvement of island community (HLMO9), living within environmental limits (HLMOs 11-13), involving stakeholders in decision-making (HLMO14), using sound science (HLMOs 19-20). Designation as a D&R MPA could also meet the Council of Europe Diploma requirement to designate Fair Isle as an MPA by 2015.

3.3.6 Criterion 6 - The Proposed Demonstration has a High Value in Terms of Helping to Improve our Knowledge and Understanding

Long-term monitoring could improve knowledge of the relationship between seabirds, prey and climate change.

The proposed management measures have not yet been defined, however the planned approach and establishment of a Steering Committee will ensure consensus of the objectives of the study prior to commencement. Points of review and assessment will ensure that the aims are met and provide the opportunity for the research to be altered to be meaningful and applicable elsewhere.
4. Conclusions

The Fair Isle proposal has a number of strengths in that it builds on an established research and demonstration base and has strong support from the local community and the majority of wider stakeholders. The proposal has provided details on the proposed governance structure, monitoring arrangements and demonstration activities. While the proposal does not include specific management measures, there is a clear basis for identification and agreement on requirements for management measures prior to their implementation.

While the proposal could result in the collection of useful information on the relationship between seabirds, prey and climate change, given the low level of current pressure from commercial fishing it is unclear the extent to which local management measures might provide significant benefit to SPA birds. However, the designation would provide the potential to implement management measures more easily should the need arise. The proposed monitoring programmes and agreement of management measures to be trialled within the D&R MPA by the Steering Committee should ensure that the findings of such work are applicable where possible to other locations in Scotland.

Notwithstanding uncertainties about the precise management measures, the proposal is only considered likely to give rise to minor costs for affected groups and only small increases to the level of ecosystem service provision or use.

Compliance with the MPA selection criteria has for the main part been achieved. While no specific management measures have been identified, there is a clear process for specifying and agreeing management measures where the need is identified. The costs and benefits of implementing the R&D MPA at Fair Isle will be small. The proposal has the backing of both Fair Isle and wider Shetland communities and the studies undertaken within the R&D MPA will be implemented through societal choice.

5. References


Bournemouth University & ABPmer, 2010. Description of the ecosystem services provided by broad-scale habitats and features of conservation importance that are likely to be protected by Marine Protected Areas in the Marine Conservation Zone Project area. Final Report, October, 2010.


UK National Ecosystem Assessment, 2014. The UK National Ecosystem Assessment: Synthesis of the Key Findings UNEP-WCMC, LWEC, UK.
Appendices
Appendix A

Detailed Methodology for Assessment of Impacts to Commercial Fisheries
**A. Detailed Methodology for Assessment of Impacts to Commercial Fisheries**

**A.1 Potential Interactions with D&R MPAs**

The impacts on commercial fisheries activity of proposed D&R MPA will depend on the management measures proposed in the D&R MPA. The currently proposed management measures for commercial fisheries activity within the Fair Isle D&R MPA is as follows:

- **Fair Isle D&R MPA:**
  - Management measures are currently uncertain. There will be no immediate restriction of commercial fishing activity but management measures may be imposed in the future, potentially affecting both existing activity and new fishing activity. Given the low level of current fishing activity, any future measures are considered likely to be of a minor nature.

A number of potential impacts may occur on commercial fisheries activities as a result of these management measures (Table A1). These impacts could be both negative and positive for different commercial fishing interests.

**Table A1. Potential for interaction**

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Potential Socio-economic Consequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of or restricted access to traditional fishing grounds</td>
<td>Reduction in landings and income, possible impact on viability of fishing businesses. Could impact on GVA of sector and employment.</td>
</tr>
<tr>
<td>Changes in gear types/methods</td>
<td>Increase in gear costs, reduction in Catch per Unit Effort (CPUE), affecting landings and income.</td>
</tr>
<tr>
<td>Improvements in local fish and shellfish stocks</td>
<td>Increased CPUE, affecting landings and income</td>
</tr>
<tr>
<td>Displacement of fishing vessels leading to changes in fishing patterns including gears used and species targeted</td>
<td>Increased steaming times, reduction of CPUE. Change in costs and earnings profile of vessels. May lead to increased conflict over diminishing fishing grounds.</td>
</tr>
<tr>
<td>Consequential impacts to fish processors</td>
<td>Loss of/increase in profit for fish processors.</td>
</tr>
</tbody>
</table>

**A.2 Potential Interactions with Biodiversity and Geodiversity Features**

The principal impacts on biodiversity and geodiversity features from commercial fisheries activity relate to habitat damage as a result of mobile gears being drawn across the seabed and biological extraction associated with harvesting of fish.
Based on the fishing methods likely to be applied within the D&R MPA, habitat
damage will principally relate to dredges (for scallops) and trawls (otter trawl for
whitefish and \textit{Nephrops} and beam trawl). Some particularly sensitive features, such
as maerl beds and other biogenic reefs may also be vulnerable to the use of
demersal static gear such as nets, lines and pots.

Impacts on fish populations may also occur as a result of the biological extraction of
fish associated with harvesting. Currently only around 40\% of quota stocks in UK
waters are harvested at sustainable levels and many stocks have reduced
reproductive capacity (Charting Progress 2, 2010). Furthermore, as a result of
overfishing, many fish and shellfish populations are heavily depleted compared to
historic levels and the age and/or size structure of populations has been altered.

\section{A.3 Assessment Methods}

The main impacts that have been considered within the assessment for the
commercial fisheries sector are as follows:

- The value of landings that would potentially be lost as a result of exclusion of
  fishing methods from within a D&R MPA area;
- The costs of modifying gears/fishing methods;
- The loss of earnings for certain types of vessels/gear types as a result of
  reductions in CPUE;
- The increases in earnings for certain types of vessels/gear types as a result of
  increases in CPUE;
- Displacement of fishing vessels; and
- Consequential impacts to fish processors.

The assessment methodology presented in this section takes account of the existing
best practice guidance relating to assessment of the impacts of developments on
commercial fisheries (e.g. Seafish & UKFEN, 2013), and draws on recent examples
of the quantification of impacts on the fisheries sector (e.g. Marine Scotland, 2013).
This indicates that the level of detail of assessment carried out on financial and
economic impacts on the fisheries sector should be proportionate to the study (size,
length, resources) and provides guidance on methodologies for assessing impacts.

\subsection{A.3.1 Loss of Traditional Fishing Grounds}

The loss of fishing grounds would lead to a reduction in catches/landings and income
for affected vessels. Due to the differences in data availability between vessels with
Vessel Monitoring Systems (VMS) and non-VMS vessels, these two fleet segments
are assessed separately, using different data sources and methodologies.
A.3.1.1 Cost Impacts

An assessment of the cost to the commercial fisheries sector of spatial restriction of fishing activities has been made in terms of the loss of the value of landings from the area to be closed to fishing (by gear type and vessel size).

Where possible, this has been assessed quantitatively:

- For UK vessels with Vessel Monitoring System (VMS):
  - Value of landings from the area to be closed, based on annual average landings value adjusted by effort from VMS data for the years 2009 to 2013. The VMS-based landings estimates have been calculated by allocating recorded landings in a day between all VMS fishing pings on that day, where a ‘fishing ping’ has been defined as one where the average speed since the previous ping is greater than zero and up to and including 5 knots for all gear types (including static gear). The effect of this is that the recorded landings by static gears have been allocated between a rather smaller number of pings than would otherwise have been the case, but no information on the landings has been lost. VMS ping data has been extracted by Marine Scotland to provide estimates of landings value by area of capture for over 15m length vessels only. The total annual landings values for each gear type have been uprated to 2013 values using GDP deflators and averaged over five years for the final analysis.

- For UK vessels for which VMS data are not available:
  - The value of landings from the ICES rectangles that overlap with the restricted area for the years 2009 to 2013 (uprated to 2013 values and averaged over five years) were obtained from Marine Scotland, with the value from each ICES rectangle pro-rated according to the percentage of overlap, by gear type. This covered under-15m vessels for the whole time series. The spatial resolution of value of landings at ICES rectangle level is not satisfactory for the purposes of assessing management measures across small areas, but these data have been used as they are the official landings data and cover all vessels, including those for which VMS data are not available. The ICES rectangle data for the under-15m length group may include cases where information on the vessel length and/or administrative port is missing from landings returns, and therefore may over-estimate impacts to the under-15m sector, particularly for some offshore sites. ScotMap data are not available for Fair Isle. Data was also sought from Shetland Shellfish Management Organisation (SSMO) on fishing grounds in Fair Isle but could not be made available. Information on Shetland shellfish landings has been used to provide an indicative value for Fair Isle shellfish catches.
For non-UK vessels:
- Value of landings data for non-UK vessels are not available for vessels that land into non-UK ports. Such data would have to be obtained from the flag states’ fisheries authorities. The scope and timeframe of the project does not allow for this to be comprehensively undertaken. VMS ping data held by Marine Scotland for foreign vessels fishing in Scottish waters for 2012 has been analysed to provide an indication of the number of vessels active in each proposed MPA. Likely gear types were identified by linking vessel identifiers to the EU Fleet Register database, using the most recent entry in the Fleet Register for that vessel. Vessels may have more than one gear type - in such circumstances it has been assumed that the most recent primary gear type as identified in the EU Fleet Register was used.

For UK VMS data, it is not permitted, for reasons of confidentiality, to disclose data on annual landings values for fewer than five vessels. This means that where a site is fished by fewer than five vessels with VMS it is not be possible to disclose annual average landings. However, in such circumstances, information on annual GVA has been presented, because these estimates have been derived using gear specific multipliers such that it is not possible to back-calculate to determine annual average landings. Where they are not disclosive, estimates of annual average landings broken down by gear type have been presented.

**A.3.1.2 GVA**

The loss of landings that result from a loss of traditional fishing grounds reduces the output of the sector. Any decrease in output will, all else being equal, reduce the GVA generated by the sector (the **direct** effect). If the decrease in output reduces this sector’s demand on their suppliers, there will also be knock-on effects on those industries that supply commercial fishing vessels (e.g. diesel suppliers, equipment suppliers, boat manufacturers and repairers and transport providers) (the **indirect** effect).

Estimating the potential impact of a decrease in output (i.e. lost landings) on the commercial fisheries sector and its upstream supply chain, will therefore involve assessing the:

- Direct impact on GVA — the reduced contribution of the commercial fisheries sector to the Scottish economy in terms of GVA;
- Indirect impact on GVA — the knock-on effects on upstream suppliers of the sector in terms of GVA; and
- Direct and indirect effect on employment — the resulting reduction in employment in the commercial fisheries sector and its upstream supply chain.
A.3.1.3 Economic Impacts (Direct Impact on GVA)

Where relevant, the impact of the loss of landings has been converted to loss of Gross Value Added (GVA) for the catching sector by applying fleet segment-specific ‘GVA/total income’ ratios to the value of landings affected. The GVA ratios have been calculated using data on total income and GVA from the Sea Fish Industry Authority Multi-year Fleet Economic Performance Dataset (Seafish, 2014). The average GVA ratios by gear type are presented in Table A2 below.

Table A2. GVA as a percentage of total income, by gear type, 2009-2013

<table>
<thead>
<tr>
<th>Broad Gear Type</th>
<th>GVA as a Percentage of Total Income (Mean, 2009-2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whitefish trawls</td>
<td>40</td>
</tr>
<tr>
<td>Nephrops trawls</td>
<td>46</td>
</tr>
<tr>
<td>Beam Trawls</td>
<td>36</td>
</tr>
<tr>
<td>Other seines</td>
<td>48</td>
</tr>
<tr>
<td>Dredges</td>
<td>43</td>
</tr>
<tr>
<td>Nets</td>
<td>54</td>
</tr>
<tr>
<td>Pots</td>
<td>48</td>
</tr>
<tr>
<td>Lines</td>
<td>43</td>
</tr>
</tbody>
</table>

(Source: Study team’s calculations, based on Seafish, 2014)

A.3.1.4 Economic Impacts (Direct and Indirect Impacts on GVA)

The knock-on effects on GVA for commercial fisheries have been estimated using the Type I GVA multiplier. The 2011 Scottish Input-Output multipliers have been applied as these are the most recent available at the time of the report and implement the change to the new Standard Industrial Classification (SIC) of Economic Activities 2007. Under the 2007 SIC, sea fishing is classified as ‘Marine Fishing and Freshwater Fishing’ (Division A, group 03, class 03.1). The industry linkages are summarised as Type I and Type II Output, Employment, Income and GVA Multipliers and Effects. Type I multipliers sum together the direct and indirect effects while Type II multipliers also include induced effects. The GVA Multiplier is expressed as the ratio of the direct and indirect GVA change to the direct GVA change, due to a unit change in Final Demand. Applying the multiplier to the estimated reduction in GVA for the industry provides an estimate of the reduction in GVA for the economy as a whole. The relevant 2011 Type I GVA Multipliers and Employment Effect that will be applied are presented in Table A3 below.

It is important to note that changes in landings due to the implementation of D&R MPAs would not result in a change in the final demand for fish. Rather, changes in fishing activity would alter the volume of fish landed and change the ability of the fleets to supply the demand.
Table A3. Marine fishing and freshwater fishing: Type I GVA Multiplier and Employment Effect (Scotland 2011)

<table>
<thead>
<tr>
<th>Sea Fishing Industry (3.1)</th>
<th>GVA Multiplier</th>
<th>Employment Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>1.4</td>
<td>15.9</td>
</tr>
</tbody>
</table>

(Source: Scottish Government, 2014)

A.3.1.5 Social Impacts (Employment Effect) and Distributional Assessment

The Employment Effect multiplier (Table A3) shows the direct plus indirect employment change to a direct output change due to a unit change in Final Demand. By multiplying the reduction in output (i.e. value of landings affected in millions) by the Employment Effect for the sector, it is possible to estimate the direct and indirect reduction in employment that would result from the potential reduction in output. The location of the impact on employment has been assessed based on the 'home port' information for VMS vessels, and based on proximity to fishing grounds for non-VMS vessels.

A.3.2 Costs of Modifying Gears/Fishing Methods

The management measures for Fair Isle D&R MPA have not yet been defined. It has therefore not been possible to assess costs associated with modifying fishing gears at this time.

A.3.3 Loss of Earnings as Result of Reduction in CPUE

The management measures for Fair Isle D&R MPA have not yet been defined. It has therefore not been possible to assess costs associated with reductions in CPUE at this time.

A.3.4 Increases in Earnings as a Result of Increase in CPUE

The management measures for Fair Isle D&R MPa have not yet been defined. It has therefore not been possible to assess costs associated with potential increases in CPUE at this time.

A.3.5 Displacement of Fishing Vessels

The loss of, or restricted access to, traditional fishing grounds as a result of implementation of management measures relating to fisheries in the D&R MPA could result in the displacement of fishing effort from one area to another, or from one gear type to another, if vessels continue fishing.

In the context of fisheries, displacement impacts refer to the impacts as a result of fishing vessels moving to fish in a different area or with different gears (rather than the loss of fishing grounds, which has been assessed above). Impacts of
displacement to different fishing grounds include direct economic impacts on the vessels displaced, such as through increased costs (increased fuel costs from longer steaming times, possible additional quota and days at sea costs) and reduced income (lower CPUE, different mix of species caught or different sizes, with different values) due to having to access different grounds which may be further away, may be less productive, and the skipper may be less familiar with. In some cases there may be a lack of suitable alternative fishing grounds where vessels can be displaced to.

Displacement can also impact on the vessels that already fish in the grounds that they are displaced to. This might result in increased competition over diminishing fishing grounds, can lead to conflict between vessels of the same gear type competing for the same resource, or between different fishing methods (e.g. static and towed gear vessels). It can also have environmental impacts on the area to which the vessels are displaced to, particularly if it is a previously unexploited or less exploited area. Conversely, displacement may reduce conflict in the area from which some vessels are displaced from.

Changes in fishing patterns including gears used and species targeted, as a result of adapting to new fishing grounds, or to continue fishing in the same fishing ground, also have costs associated. This includes the cost of developing new gear types, adapting vessels to function with different gears, and re-training crew to work with different fishing methods.

The assessment described in Section A3.1 quantifies the worst-case scenario of the complete loss of traditional fishing grounds and loss of all fishing activity (for relevant gear types) in those areas. This assumes that the value of landings from the area would be lost, with consequent impacts on GVA and employment in the fleet segments affected. It assumes there is no adaptation within the site or displacement of fishing activity to other grounds. This represents the worst-case impact and in reality, vessel owners are likely to try and adapt within the site (e.g. by changing gear type or target species), or search for alternative fishing grounds, in an attempt to maintain profitability. Such displacement, if it occurs, will have the effect of reducing the magnitude of the impact on landings and income.

The extent of displacement will be a function of the loss or restricted access to fishing grounds, the impact of which is assessed. However, it is difficult to forecast the scale and nature of adaption or displacement of fishing activity that would occur and hence estimate, even qualitatively, the extent to which this would offset the reduced value of landings generated by D&R MPA designation. This will depend on an array of different factors, as discussed above, for example:

- The availability of alternative fishing grounds and their distance;
- Whether vessels change gear type and target species;
- The knowledge and experience of the skipper and crew, and the potential range of the vessel, or the potential for gear adaptation;
The relative catch rates and associated profitability of the new fishing grounds; and

The effect on other vessels fishing in these grounds.

In light of the difficulties involved in predicting the scale and nature of adaptation/displacement of fishing activity and the associated costs, the potential impact of displacement will not be quantified. It will be assessed in relation to the significance of impact of loss of landings due to loss of or restricted access to fishing grounds. Potential displacement effects will be described qualitatively for those fleet segments likely to be most affected by the loss of traditional fishing grounds.

A.3.6 Impacts on Fish Processors

Management measures that restrict commercial fishing activity have the potential to reduce the quantity of fish and shellfish landed at ports and hence to reduce the supply of locally-landed catch to fish processing facilities, hotels/restaurants and the wholesale and retail trades (the downstream supply chain). Conversely, improvements in local fish stocks that lead to increased landings may benefit the downstream supply chain.

Reductions in landings may cause consequential impacts to fish processors resulting in loss of profit. This may arise from a loss of local landings available for processing, reducing turnover, or increased costs in sourcing additional material from imports or from further afield. However, import substitution is likely to occur, which may minimise any final impact.

Where appropriate, the potential impacts (either positive or negative) of designation on the fish processing industry have been estimated in terms of the relative change in potential landings, by port of landing. These have been assessed on a gear-specific basis and in relation to changes in landings of demersal, pelagic and shellfish species. For the over-15m sector, the ‘port of landing’ information has been used to identify at which ports the processing sector might be most affected.

A.4 Limitations

- The extent to which displacement of activity will occur (rather than loss of the value of landings) is uncertain. The quantification of cost impacts to the sector assumes that all affected fishing activity is lost. In reality, it is likely that some displacement would occur. The cost estimates presented for this sector, therefore, represent worst case estimates.
- The quantification of cost impacts to the sector is restricted to UK vessels, as comprehensive data on non-UK vessels is not available to allow quantification of impacts on a site basis. Impacts on non-UK vessels are assessed qualitatively and in terms of the number of vessels likely to be affected by proposed management measures.
Spatial resolution of data on non-VMS vessels is not sufficient for an accurate assessment of cost impacts to this fleet segment, and the non-VMS group may include cases where information on vessel length and/or administrative port were missing on landings returns, particularly for offshore sites.

VMS-based estimates of the value of landings may over- or under-estimate the costs to the sector, as they provide an approximation of the location where catches were taken.

To avoid inappropriate disclosure, some annual average loss of landings figures cannot be presented and for others, affected gear types will be grouped.

As the value of future landings cannot be forecast, it is assumed that the value of landings are constant over time. The average value of landings per year estimated is therefore assumed to be the same in each of the 20 years covered by the IA. In reality, it is likely that the value of landings in the MPA will fluctuate over time and hence the estimated loss in landings may underestimate or overestimate the true future value of landings. As the GVA and employment estimates will be based on the value of affected landings the same limitation applies.

Similarly, the unit value of fish has been assumed to be constant over the period of the IA. In reality, the fish price may rise or fall over time, due to a range of factors which are beyond the scope of this assessment, in particular supply from other fisheries and other parts of the world, demand from local, European and international markets, and market preferences for different species.

Although the Sea Fish Industry Authority Costs and Earnings Survey (Seafish, 2013) represents the best data available to estimate GVA on a sector-specific basis, the data have some limitations. For example, the total income, operating profit and crew share data includes income earned by fishing vessels from sources other than fishing (e.g. towage activities, selling quotas and days at sea). The VMS estimates do not include non-fishing income and this mismatch may overestimate or underestimate the impact on GVA for some fisheries. Non-fishing income, however, tends to be a fairly insignificant proportion (0%-10%) of total income.

The multipliers used to estimate the indirect GVA impacts and the direct plus indirect employment effect that could be generated from the estimated reduction in the value of landings, relate to ‘Marine Fishing and Freshwater Fishing’ and not the specific gear types affected. They may, therefore, underestimate or overestimate the impacts. The multipliers - which are national multipliers - will be applied at the D&R MPA level and port level to estimate the economic impacts by D&R MPA and by port. Local and regional multipliers are not available and hence the application of national multipliers may overestimate or underestimate the impacts. Finally, application of the multipliers also assumes that a reduction in output is similar to a change in Final Demand and that there is no rise in the price of fish to offset the reductions in the value of landings.
A.5 References


Appendix B

Fair Isle Demonstration and Research MPA Assessment Information
B. Fair Isle Demonstration and Research MPA Assessment Information

B.1 Fair Isle Description of Proposal and Consultation

B.1.1 Original 2011 Proposal

In 2011 the Fair Isle Marine Environment and Tourism Initiative (FIMETI) presented their D&R MPA as an initiative led by the Fair Isle community in partnership with the Fair Isle Bird Observatory and The National Trust for Scotland (Riddiford and Riddiford, 2011). The document presents commentary on the suitability of Fair Isles as a D&R MPA, including a description of the area, and factors to be considered for the designation of the Fair Isle R&D MPA. Detail on the aims and objectives based on the Marine Scotland guidance document are described together with an outline work programme. The proposal is supported by a number of appendices and maps.

The proposal was designed to serve three purposes, namely:

- To trial a series of management measures, supplemented by interpretation and dissemination, which demonstrates the role of MPAs in delivering fully sustainable marine management;
- To demonstrate the relationship between a fully functioning marine environment and the socio-economic stability of peripheral coastal communities; and
- To meet a requirement of the Council of Europe in the form of a condition on the renewal of the Council of European Diploma for Fair Isle.

The proposal considered the most significant novel aspect of the proposed MPA as being the involvement of the local community in partnership with research bodies on and off the Isle. It suggested that Fair Isle was not the only coastal community heavily reliant on a fully functioning marine environment. The proposal stated that a local community stake in the marine planning process, and implementation of management measures which maintain the biodiversity elements essential to the socio-economic wellbeing of the community, heralded a new approach targeted at benefiting coastal communities throughout Scotland. It was suggested that the proposal provided a willing and suitable site, and an opportunity, to test and implement pilot measures for developing and applying the principles of sustainable use in the marine environment.

The Fair Isle community has identified benefits which extend beyond its own shores. Coastal communities in many parts of Scotland share the need for the maintenance and enhancement of an essential socio-economic resource, in the form of tourism, interpretation, education, heritage protection, recreation and sustainable economic use of the sea. The proponents suggest that one role of the MPA network should be to pilot measures which safeguard this resource and give succour to communities in other remote or peripheral coastal locations.
The proponents suggest that their proposal demonstrates the value of MPAs not just in protecting biodiversity but also in recognising the socio-economic values of biodiversity beyond the traditional largely consumptive activities.

FIMETI summarised the proposal benefits as:

- Supporting sustainable economic growth for a peripheral Scottish community; and
- Demonstrating Scottish Government commitment to take into account a wider range of socio-economic values and benefits of the marine resource beyond its consumptive exploitation.

A number of other benefits were also by FIMETI identified, including:

- Plugging gaps in our knowledge of the marine environment and ecosystem services;
- Improving sustainable resource use, thus contributing to conflict resolution;
- Meeting international commitments; and
- Trialling a management framework for the recent seaward extensions of seabird SPAs which links that designation with the SPA conservation objectives.

It was also anticipated that there would be added-value environmental spin-offs for marine biodiversity. These include:

- Preventing further deterioration and supporting recovery for the marine resources, particularly seabirds (linked to SPA measures);
- Protecting representative habitats and species communities - key factors in biodiversity conservation;
- Protecting nursery areas for commercial fish; and
- Reducing damage to the seabed by providing recovery areas for demersal/benthic resources and the ecosystem generally.

The proposal also stated that the Fair Isle D&R MPA had full community backing, active community knowledge and experience of local seas, long-term maritime research elements already in place, good research facilities available and partnerships already established with national research bodies and institutions to deliver these objectives.

The proposal also described the methods of Dissemination and Education, where the isle was already engaged in both activities and believed to be well placed to participate and even take the lead on some issues. It was stated that the D&R MPA would be able to demonstrate how a holistic approach to marine management, with sustainability at its heart and could benefit socio-economic, cultural and heritage values as well as biodiversity conservation.
In order to deliver the aims of the proposal FIMETI developed a framework from which to develop the actions and activities required to achieve them. They presented a series of more specific objectives as follows:

- Establish policies to manage a productive marine and coastal environment for the benefit and prosperity of local communities (Objective 1);
- Identify areas with different priorities for sustainable use (Objective 2);
- Identify and manage activity to minimise conflict (Objective 3);
- Safeguard areas where there are locally and nationally important marine species and habitats (Objective 4); and
- Develop a full programme of research, dissemination, interpretation and education to supplement and support the MPA aims and objectives (Objective 5).

The proposal put forward a number of suggestions for scientific research. These elements were to be in the form of Demonstration in their own right because they would provide a test bed for novel measures which have wider implications. Demonstration also implies dissemination, as there would be little point demonstrating something which has no observers or recipients, and thus no practical outcome. Implementation of the process would bring sustainable development gains and benefits, both locally and nationally, through additional spin-offs. The full process was described as:

Research = Demonstration ► Dissemination ► Additional spin-offs

The work programme was sub-divided into 3 categories: Sustainable management of the marine resource; Biodiversity conservation; Dissemination. Reference is also made to Additional Spin-offs but these were not included in the main work programme.

A number of actions were selected for each category within the work programme. Each was given a title and a reference code, and a logical framework has been applied. The actions are as follows:

- Sustainable Management of the marine resource:
  - Sea-Fisheries Technical Measures;
  - Selective Fishing of Shellfish; and
  - Shipping Area to be Avoided.

- Biodiversity Conservation:
  - Special Protection Area for Birds, marine measures for conservation management;
  - Priority Habitats and Species - identify and maintain; and
  - Monitoring for Ecosystem Condition.

- Dissemination:
  - Demonstration Site for maritime research, education and dissemination
The proposal recognised that a steering committee would be required to coordinate the various research projects and to ensure their cross-compliance with objectives and other studies. Fair Isle Bird Observatory was recommended as the hub or nerve centre for the operation as it would be the on-site base for visiting researchers. Potential partners for each action were identified, although it was stated that this was not a closed list and it was anticipated that the launch of the MPA would draw in additional relevant researchers and organisations. The proposal also suggested that the implementation of the work programme required a zonation approach to Fair Isle waters. The proposed location of each zone is given in Image B1.

Image B1. Fair Isles Proposed D&R MPA

B.1.2 Supplementary Information Provided in October 2014

In October 2014 FIMETI provided supplementary information which presented their further thoughts on the proposal. In this they stated that the Fair Isle community would like to see a collaborative and adaptive management scheme in place that provides opportunities for marine life in their local waters to recover. It was recognised that some changes in the local marine environment are not easily managed either because they result from influences far from Fair Isle or because they were more generally climate related. However, it was suggested that there was an opportunity to monitor both local and more general impacts of anthropogenic activities and climate change. It was proposed that the detailed monitoring of marine
birds and mammals that presently takes place could be supplemented by zoning areas around Fair Isle, and monitoring selected fish and invertebrates in control vs fished areas. A number of Fair Isle’s bird species (e.g. shag, eider duck, and black guillemot) feed on benthic organisms (e.g. crabs, shrimps, bivalves, flatfish) typically caught close to the island and which are believed to be relatively sedentary. Other species of local importance to Fair Isle’s marine birds and mammals besides sand eels were suggested as saithe, haddock, cod and whiting.

The proposal did not intend to exclude all fishing from Fair Isle waters therefore, but, rather, it intended to establish a number of conservation zones that can serve as controls for monitoring changes in the marine communities. It was suggested that the sizes of these zones and their specific locations would need to be decided in conjunction with Marine Scotland Science, as would the monitoring methods to be adopted.

The additional information added that there is a suite of global research currently investigating effectiveness of MPA governance within the framework of collaborative management (co-management) and mentioned that Fair Isle was perfectly suited to be part of this research. It was suggested that a D&R MPA on Fair Isle could provide the ideal legislative framework to demonstrate new approaches to management, free from the more prescriptive obligations, which other MPA’s may implicate. Moreover, the community on Fair Isle is an active and skilled one, which has in the past participated in marine management through, for example, monitoring age structure of fish and shellfish communities. It was suggested that there was scope to incorporate other measures (e.g. a body condition index, determination of carapace widths of crustaceans, tagging of lobsters, etc.) from select locations. It was noted that the routine monitoring of seabird chick diet for a number of species provides supplementary quantitative information on resource availability, particularly when coupled with tracking of foraging seabirds.

Under the *EU Birds Directive*, Fair Isle was designated in 1994 a Special Protection Area (SPA) for its internationally important seabird populations. The Directive requires governments to set conservation objectives and places a legal obligation on them to meet those objectives. In the case of Fair Isle’s seabirds, the objective of the SPA is to maintain and enhance the breeding populations. This objective cannot be met without some protection to the wider marine environment. MPA designation has wider, Scottish, significance. It presents the opportunity to research how to manage SPAs around seabird colonies as well as establishing a model for community involvement in marine environmental management.

In addition Fair Isle is one of only two sites in Scotland to have received a Council of Europe Diploma (in 1985), which recognises sites of outstanding natural quality whose communities live in harmony with their environment (Mayol, 1995; Sultana, 1999). The latest renewal of the Diploma (signed by the Ministers of all 47 participating states) laid down a condition that Fair Isle should establish a Marine Protected Area (Council of Europe, 2010). Failure to meet this condition would lead to the island losing its Diploma status at or before the next renewal (in 2015).
The purpose of the proposed D&R MPA was stated as follows:

- To investigate the reasons behind the observed fluctuations in prey availability which are affecting reproductive success and hence causing significant population declines in a number of seabird species breeding on Fair Isle;
- To improve knowledge on inshore fish populations and communities around Fair Isle, and contribute to a wider understanding of inshore fish populations around Scottish waters;
- To investigate whether seabird populations on Fair Isle are affected by the direct influence of human activities (e.g. fishing) in the vicinity of the isle and/or by wider changes in the marine environment (e.g. climate change);
- To investigate whether locally led management measures could be put in place either to directly improve the status of seabirds and inshore fish populations on Fair Isle, or to offset the impact of wider changes;
- To demonstrate the value of the seabirds and wider marine resource to the local Fair Isle community;
- To demonstrate the socio-economic benefits that MPA designation could bring to the local Fair Isle community; and

The proposal includes the area of Scotland’s territorial seas that surround the island of Fair Isle. There are several existing administrative boundaries of relevance to the proposed aims and objectives of the MPA, including the 2 km SPA marine extension for seabirds, the 6 nautical mile inshore fisheries boundary and the 12 nautical mile boundary, which is used in marine spatial planning. It is proposed that these existing boundaries are applied to the Fair Isle Demonstration & Research MPA.

B.1.3 Fair Isle MPA Proposal: Clarification Notes Dated 7 November 2014

Further to the meetings held on Fair Isle, FIMETI prepared an additional note of clarification which stated that the proposed boundary to the MPA is as Zone 1 in Table B1 of the original proposal (page 35) comprising a rectangular box with the following corner coordinates:

<table>
<thead>
<tr>
<th>NW Corner</th>
<th>NE Corner</th>
<th>SE Corner</th>
<th>SW Corner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed MPA Boundary</td>
<td>59° 36.00’ N</td>
<td>59° 36.00’ N</td>
<td>59° 27.80’ N</td>
</tr>
<tr>
<td></td>
<td>001º 44.50’W</td>
<td>001º 30.65’W</td>
<td>001º 30.65’W</td>
</tr>
</tbody>
</table>

The Area to be Avoided (ATBA) by vessels carrying hazardous cargos, boundary comprising the outer ring for the original proposal is no longer included in the MPA. It is an established voluntary exclusion zone and its management and monitoring is better served by the current authorities.

Zone 1, as defined above, is proposed as a Technical Measures Research Area.
The inner box, shown as vertical hatching on Map 2 of the original proposal, depicts the area designated as an SPA by the Scottish Government. In the current amended proposal there are no other zones at this moment in time. It is envisaged that a first phase of the D&R MPA would establish, in partnership with research groups and stakeholders, a zonation pattern which meets the D&R MPA objectives and measures required to meet them. The first phase would also seek to generate a series of measures for managing the SPA.

The proponents indicated that the proposal was intended to provide a research platform and test bed for management measures improving knowledge and with implications for sustainable management in other coastal areas. Applied research based on Fair Isle’s range of well-established and long running data sets could assist with national planning in the development of management measures for seabird SPAs and in advising the Scottish Government on favourable management of seabird SPAs, as laid out in the EU Birds Directive.

The proposal has been modified to provide a phased approach. The first phase will give the opportunity to bring together the various research groups, develop an agreed way forward for all stakeholder groups and set clear objectives for the direction and achievable research measures to achieve those objectives. A second phase would implement the agreed plan to fill gaps in current knowledge, maintain and extend the long-term datasets already in place and use these data cooperatively for a more comprehensive understanding of the immediate marine environment, currently in considerable flux. These would provide a building block on which to develop management measures favourable to sustainable use of the marine resource.

The original idea to seek a Marine Protected Area came from the Fair Isle community and the community remains at the forefront of its development, though seeking and enhancing partnerships within the research realm and with other stakeholders. This is steered by the FIMETI, who are a sub-committee of the Fair Isle Community Association. All sub-committees, including FIMETI, report to the Fair Isle Community Association at quarterly meetings. These meetings are open to all members of the community and attended by representatives of all households. This allows a high level of consensus for matters of community interest and this has generated a one-hundred percent approval of the MPA, as demonstrated repeatedly at Community Meetings and in every resident signing a petition on the issue to the Scottish Parliament Petitions Committee. The community is currently working with a number of supporter groups in establishing funding for a Steering Officer for the MPA. A major role of the Steering Officer will be to ensure a coordinated approach to the research programme by seeking cooperation, communication and knowledge exchange across the various research groups. The Steering Officer will report back and be answerable to the Fair Isle Community Association, thus establishing
governance by the Fair Isle community. Community “ownership” is an important element in the development of the MPA, not least by providing a model for other peripheral communities looking to benefit from a healthy, fully functioning marine environment.

B.1.4 Fair Isle (proposed) Demonstration & Research MPA, June 2015

In June 2015 FIMETI provided an additional document in which they sought to clarify the outstanding recommendations as set out in the ABPmer (2015) draft assessment report. The main points of consideration centred on the following:

- A Governance Framework;
- A Research Proposal and Implementation Plan;
- The Proposed Monitoring Programme;
- Funding Streams and Prospects;
- Demonstration & Research MPA Benefits; and
- Dissemination of Findings.

The proposal has provided a clear governance framework which is designed to assure adequate accountability to the many D&R MPA stakeholders and to encourage performance improvement while meeting obligations and legislative requirements. It is intended that the framework will assist all stakeholders to understand and apply the principles of good governance, and to adaptively assess the strengths and weaknesses of governance practice and accordingly improve it for the benefit of the MPA objectives. The governance framework sets out:

- The mechanisms by which possible management measures might be implemented;
- The structure of governance which the D & R MPA could assume;
- The composition of the suggested executive level including information on the steering committee (membership and terms of reference);
- The composition of the suggested management level; and
- The composition of the suggested implementation level.

The governance mechanisms by which possible management measures might be implemented has been designed to be inclusive and to promote input from all stakeholders. There is a long history of research already in place which provides an initial baseline for some aspects of the proposed D&R MPA research going forward. The proposal indicates that it is intended to appoint a project officer in order to continue to deliver existing monitoring programmes, to enhance them and provide

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1 Community “ownership” does not imply ownership of the sea. The community is looking for a shared approach, incorporating input from all stakeholders and developing a similar shared approach by the various research groups, current and future, afforded the opportunity to get involved in this novel development.
Assessment of the Fair Isle Third Party Demonstration and Research MPA Proposal - Criteria and Socio-economic Final Report

co-ordination. FIMETI intends to make such an appointment with the remit to develop the partnership approach that the island has been seeking.

Three levels of engagement are proposed for the governance structure:

- Executive Level: Steering Committee;
- Project Management Level: Project Officer Support Team; and
- Implementation Level: Project Officer (& any technical Inputs).

It is proposed that each level would have a definition and the Steering Committee will have Terms of Reference which will include a Participation and Involvement Protocol and will reach consensus with stakeholders on all matters concerning the development of management measures, reviewing outputs, seeking dissemination pathways and making recommendations for further studies. The delivery of the day to day tasks would be carried out by the project officer overseen by the responsibility of the Fair Isle Community Association (FICA).

Two main objectives for the D&R MPA have been now been identified as:

1. To investigate the factors affecting seabird populations on Fair Isle, particularly climate change impacts and direct human influences. This will be done through:
   a. Studying seabird productivity and prey availability (which will also help expand knowledge on inshore fish and invertebrate populations); and.
   b. Exploring the potential for voluntary measures through local management measures in partnership with all stakeholders.

2. To demonstrate the socio-economic benefits of the marine environment and the additional benefits that MPA designation can bring to the community.

It is stated that the project has wider ‘spin-off’ benefits for Scotland more generally:

- Exploring a model for collaborative management (co-management) of the marine environment and demonstrating how coastal communities can involve themselves in local management;
- Demonstrating that investing funding and resources into co-managed sites is a sound investment for government departments;
- MPAs are widely viewed as being in place for nature conservation but they can also contribute to the improved management of other interests. Pioneering the D&R model could demonstrate to other interest groups a positive process within which gains are to be made from the establishment of MPAs rather than the usual perception of loss;
- The habitats around Fair Isle are representative of a large number of Northern Isles and coastal Scotland areas so biological results here are likely to be more widely applicable; and
- Fair Isle being used as a potential control site for alien species.
FIMETI has proposed a four phased approach to the work with each phase covering the following:

- Phase One - Initiation and Gap Analysis: Years 1 - 3;
- Phase Two - Demonstration and Trialling of Relevant Identified Actions: Years 4 - 10;
- Phase Three - Evaluation: End of Year 10; and
- Phase Four - Enhancement: Year 11 Onwards.

The proposed area of the R&D MPA has remained the same as identified in October 2014 and as shown in Image B2.
FIMETI has proposed a series of management programmes which will be developed with the Steering Group during Phase 1, these include:

- A desk study of currently available fish stock data;
- Work closely with SSMO, appreciating their remit to monitor the Shetland shellfishery to ensure sustainability, to develop and implement a Fair Isle shellfish monitoring programme (using e.g. trapping rates, individual size and population dynamics) to evaluate impacts of creel fishing on local stock;
- Socio-economic research into the value of the marine resource to all stakeholders and its particular relevance to the Fair Isle community well-being, job creation and future socio-economic development;
- The use of Fair Isle as a control for a Shetland-wide study of alien marine species and their impact on the natural environment, human structures etc. in partnership with Marine Spatial Plan group;
- Ongoing development of a structure and framework for integrating the variety of studies into a cross-sectoral approach. Interpreting within this the various agencies, pressures and impacts on the marine ecosystem and its component parts.

FIMETI suggests that Phase 2 will include a number of initiatives that are already in place being undertaken by the community and FIMETI partners.

FIMETI has identified a number of funding streams that are currently funding ongoing initiatives, these include income from FIBOT, UK Meteorological Office, UK JNCC, National Trust for Scotland, Flora and Fauna International, RSPB and SNH. In addition there are a number of organisations who provide 'in-kind' contributions and the community will continue to look for partnership opportunities with other initiatives.

The suggested benefits of R&D MPA designation remain the same as presented in the FIMETI October, 2014 documents.

FIMETI has stated that the dissemination of findings will be achieved through the various technological and traditional media, direct visitor, community and educational involvement in the basic research programme, public participation events, research publications and dissemination on and off the Isle.

**B.1.5 Promoter Meetings**

As part of this study there was a requirement for the contractor (ABPmer) to engage with the promoters, in this case FIMETI, to fully understand the nature of their proposal. Prior to the visit ABPmer prepared and circulated some initial questions relating to the proposal and supplementary information to assist with the meetings. Representatives from ABPmer, Scottish Natural Heritage and Marine Scotland visited Fair Isle on 29 October 2014 during which two meetings were held, one with a
representative of FIMETI and the second meeting with representatives of Fair Isle householders.

During the first meeting, FIMETI clarified the proposals in reiterating that the aim of community was to maintain numbers of seabirds that the island relies on to attract tourism and that they consider that main impact on seabird numbers is climate change. Fair Isle would like to be a research / test bed for studies to be undertaken on the marine environment, sustainable management and climate change as they see the island as ideally placed, being on the cusp of North Sea and the Atlantic, as well as being important for studying climate change as an observation post for the rest of Scotland. Therefore the MPA would be the platform for the Marine Spatial Plan to undertake studies they or others (e.g. an umbrella group of interested research organisations) consider useful and appropriate to Fair Isle.

During discussions FIMETI withdrew the proposed prohibition on vessels transporting hazardous cargoes from the proposal, as it was recognised that the voluntary arrangements in place already achieved a high level of compliance. FIMETI also understood that imposing a NTZ was counter-productive at this stage and similarly removed this from the proposal.

The boundary of the proposed D&R MPA was discussed and FIMETI confirmed that this would remain as that provided in 2011 and presented as the technical measures research area, this falls outside the SPA boundary and would not require management measures immediately. This boundary is seen by the islanders as helping to maintain the voluntary sandeel closure to assist the upkeep of prey numbers for seabirds. FIMETI also clarified that they were not looking to replace current fisheries management or to take control of fisheries management and that they would like to work with those currently involved in managing local fisheries such as the Shetland Shellfish Management Organisation (SSMO) and encourage fishermen to provide data. In addition they stressed that fisheries management would only occur as a result of a need under a research framework and decided through discussion with stakeholders.

FIMETI has received interest from various organisations to use Fair Isle as a model for sustainability of rural coastal communities that depend on marine environment. They consider this to be an example of meeting government’s sustainable rural community development ideals. FIMETI has considered a number of routes through which to manage the MPA and these include using a policy officer employed by Flora and Fauna, (they are currently seeking funding for this) to set up an umbrella group of organisations interested in using Fair Isle to have a single group as the conduit for undertaking and hosting research. A second route for governance would be through the Shetland Marine Spatial Plan with dissemination of local information being via the local atlas. Whichever route was taken the Fair Isle community see themselves as main stakeholders as they are most directly impacted by changes that occur on and around the island.
FIMETI emphasised the community consensus on the island for the MPA via the Fair Isle Committee, the minutes of which were cited as the Committee record and evidenced in signatures to the Public Petitions Committee.

During the evening meeting, following an introduction by ABPmer about the purpose of the meeting and a presentation of the discussion held with FIMETI, the community confirmed their agreement of the MPA boundary and the removal of the NTZ. However they would like to see something in place to ensure that the area remained in good condition to allow for it to remain attractive to researchers. The islanders’ confirmed there was consensus of all for the D&R MPA and signed a meeting attendance sheet to support this claim.

The community consider Fair Isle to be ideally placed biogeographically and in terms of levels of anthropogenic activity, and also mentioned that the isle was named as being one of the top 5 world islands by National Geographic having a tourism value to rest of Scotland and Shetland, and this should be considered in terms of its benefit to wider stakeholders. They also would like to see the island as a world leader in oceanographic science. The islanders felt that the socio-economics of any proposal needed to be considered as the benefits that the island could accrue should not be ignored.

The meeting closed with the Fair Isle community being asked to provide clarifications to their proposal by 14 November 2014 which should provide more detail on how Fair Isle proposed to fund the MPA; and if possible to also provide a scientific justification for putting measures in place to protect the SPA from outside activities for the MPA.

**B.1.6 Stakeholder Meetings**

In order to understand the views of relevant stakeholders face to face and telephone meetings were held with a number of key stakeholders. The main focus of these meetings was to understand the level of engagement that had occurred with interested parties, to gather their views of the proposal with respect to their individual interests and the impacts such a designation might have on their livelihood.

Following a review of the baseline data of activities occurring within the vicinity of the D&R MPA boundary, as detailed in Section 3.2, the sector with the most interest were those in the fisheries industry.

Face to Face meetings were held on Fair Isle and Lerwick during the contractor’s visit to the area between 29 and 31 October 2014. These meetings involved ABPmer, Marine Scotland and SNH and included talks with the members of the Fair Isle community, representatives from the Shetland Shellfish Management Organisation (SSMO), Shetland Island Council and RSPB. In addition two telephone calls were held with the representative from the Scottish Fishermen’s Federation (SFF) on 13 and 24 November 2014.
B.1.6.1 Fair Isle Community Representatives 29 October 2014

The meeting followed discussions with FIMETI and the islanders, who represented each household. It was noted that there was consensus on the whole island in support of the D&R MPA and all present signed a document to confirm this. They also stated that they had signed a petition on 26 March 2012.

ABPmer presented the outcome of the meeting with FIMETI which included suggested changes to the proposal in respect of the boundary, where this was to be simplified to one area removing the NTZ and any increased the restrictions within the ATBA. The islanders agreed with these changes however they sought assurance that there would be measures to ensure that the area remained in good condition to allow the island to continue to attract research groups.

The community considers Fair Isle to be ideally placed biogeographically and in terms of levels of anthropogenic activity, and mentioned that it was named as being one of the top 5 world islands by National Geographic due to the tourism value it has to rest of Scotland and Shetland, and this should be considered in terms of its benefit to wider stakeholders. Leading from this the islanders would like to see Fair Isle become a world leader in oceanographic science.

Discussion covered the requirement to provide information on governance and it was concluded that this would be via the community, with help from a policy officer. It was suggested that an umbrella group would also undertake reviews of the MPA to ensure it is delivering its objectives for the community.

The community also felt that the socio-economic considerations should include the positive benefits to the island alongside those which might be a dis-benefit.

B.1.6.2 SSMO Board Meeting on 30 October 2014

ABPmer, Marine Scotland and SNH representatives joined the SSMO Board during a board meeting on 30 October 2014 to discuss the Fair Isle D&R MPA proposal and to provide an update on the proposed changes being put forward by FIMETI. The Board confirmed that have not had discussions with Fair Isle, however they acknowledged that FIMETI had spoken to SFA. The Board confirmed that Fair Isle is covered by the SSMO Regulating Order for shellfish within 6 nm of Fair Isle, which means that the shellfish interests around Fair Isle are already protected by the SSMO as SSMO recognises need to maintain healthy seas and therefore do not encourage members to fish around Fair Isle. The Board confirmed that they could see merits in what Fair Isle are trying to do and SFA are not opposed in principle but they consider it may set a precedent for designations which have not yet been fully worked up before other stakeholders can agree to them or at least consider them. The Board concluded that they would wish to have significant input in any management hierarchy.
B.1.6.3 SSMO Secretary Meeting on 31 October 2014

Following from the SSMO board meeting, the project representatives sought clarification from the SSMO regarding landings from Fair Isle waters as the ‘Shetlands is Statistic 2013’ booklet provided information for the Shetlands as a whole. The meeting with the SSMO Secretary discussed this possibility and confirmed that the SSMO Board would be consulted to see if this information could be released. The Secretary also sought agreement that if the D&R MPA went ahead that it would be done with SSMO and confirmed that SSMO would be happy to work on any proposal as long as it was scientifically justified. [Post meeting note: the SSMO were unable to provide the data requested].

B.1.6.4 Open Meeting Held at SNH Offices on 31 October 2014

This meeting was attended by representatives from Shetland Islands Council (SIC) and RSPB / Bird Observatory. The attendees were given an update of the changes to the FIMETI proposal, and were supportive of what FIMETI was seeking to do. They recognised that FIMETI had an expectation that the management could have been undertaken by the Shetland Marine Spatial Plan (MSP), SIC confirmed that would not be possible because the MSP was not statutory, however it was confirmed that they could support management measures once the MPA was designated. The attendees considered that the isle has a lot of possibilities for research as a test bed and indicator for rest of Shetland in particular to consider climate change, and believe could apply to rest the of Scotland too. It was also mentioned that the FIMETI proposal had been discussed in a number of Shetland Marine Spatial Plan meetings and was an agenda item.

B.1.6.5 Telephone Meetings with SFF Representative on 13 and 24 November 2014

Telephone calls between SFF, ABPmer and Marine Scotland were held to discuss firstly the FIMETI proposals to date (13/11/2014) and secondly to discuss the further clarifications (24/11/2014).

Firstly SFF confirmed that they were not aware of any changes to the proposal and generally had concerns that the management measures in the original proposal were unclear and that his members would need to fully understand these. SFF confirmed that they would be happy to work on a steering group, and on any additions to the proposal, however were concerned that there was a lack of project detail and were wary of providing open support. If means of being able to be part of decision-making were made available for fishermen, more support could be gathered.

The second call was held after the FIMETI clarification document dated 7 November 2014 was issued. SFF felt that this did not provide enough clarity on the management of the site and although they were generally sympathetic they did not feel it reaches what is required for the guidelines; especially with respect to the...
uncertainty around measures. SFF confirmed that fishing activity around Fair Isle was currently low however this has not always been the case and there was a need to safeguard for the future. SFF suggested that if the proposal could be improved i.e. with more detail, the fishermen would be willing to be consulted and enter into discussion.

SFF were also concerned that this fluid approach, if successful, would set a precedent for the designation of other MPAs without definitive management measures and sufficient consultation.

**B.1.6.6 Open Meeting Held at SNH Offices on 18 March 2015**

This meeting was attended by representatives from Shetland Islands Council (SIC) and RSPB / Bird Observatory and an ABPmer representative arrived at the latter end of the meeting. The meeting was called to discuss the draft document which FIMETI had prepared following receipt of the Draft report from ABPmer. The meeting discussed issues regarding governance, objectives including consideration of the Non-take /indirect values that marine environment brings to small communities (links to SAMS interest) and would also link to a community development project currently underway with HIE, Discussion continued in connection with fisheries measures and whether Fair Isle could be used as a possible control site for alien species (as part of MSP). The group discussed the process and what would happen after 10 years of D&R MPA. Fair Isle community want to see management in place to keep long term sustainability and stability for the island. The group agreed to develop an implementation plan for the longer term i.e. how will successful management continue post D&R MPA (e.g. maintain MPA/another designations, links to marine spatial planning, policy statements etc). Possible funding streams were also discussed.

**B.1.6.7 Fisheries Meeting at SSMO Offices on 19 March 2015**

A meeting was held to discuss concerns of the fishing community in particular and was attended by representatives form SMMO, SFF, SFA, FIBO, SNH, FIMETI and ABPmer. Discussion firstly centred around the MPA process in general and the Fair Isle proposal in particular, as to why Fair Isle were looking at an R&D MPA rather than a NC MPA, what was the timescale of the project, and how was the project officer to be funded? The group was fairly supportive of the governance with a Steering Group and were keen for terms of reference to be drawn up for this group with a clear remit and chair. Concern was expressed about the objectives and it was felt that the level of detail provided was in-consistent and too ambitious. It was agreed that the project should identify a couple of objectives that were credible, achievable and that all could buy into. Discussion then led to the fisheries component of the proposal and concern was raised about imposing additional management measures onto activities that are already well managed and reported. It was decided that all references to the zones should be removed. The meeting closed with the attendees being generally supportive in principal of the proposal but wishing to see more clarity on the objectives.
## Appendix B1. Figures

<table>
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<tr>
<th>B1.1</th>
<th>Aquaculture Sites around Fair Isle</th>
</tr>
</thead>
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<td>B1.2</td>
<td>Aviation around Fair Isle</td>
</tr>
<tr>
<td>B1.3</td>
<td>Coastal Protection around Fair Isle</td>
</tr>
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<td>B1.4</td>
<td>VMS Data around Fair Isle</td>
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<td>B1.5</td>
<td>Energy Generation around Fair Isle</td>
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<td>B1.6</td>
<td>Military Practice Areas around Fair Isle</td>
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<td>B1.7</td>
<td>Oil and Gas around Fair Isle</td>
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<td>B1.8</td>
<td>Ports and Harbours around Fair Isle</td>
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<td>B1.9</td>
<td>Power Cables around Fair Isle</td>
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<tr>
<td>B1.10</td>
<td>Recreational Boating around Fair Isle</td>
</tr>
<tr>
<td>B1.11</td>
<td>AIS Transit Lines (2012) around Fair Isle</td>
</tr>
<tr>
<td>B1.12</td>
<td>Telecommunication Cables around Fair Isle</td>
</tr>
<tr>
<td>B1.13</td>
<td>Tourism around Fair Isle</td>
</tr>
<tr>
<td>B1.14</td>
<td>Water Sports around Fair Isle</td>
</tr>
</tbody>
</table>
Aviation around Fair Isle

Figure B1.2
Coastal Protection around Fair Isle

- Fair Isle D&R pMPA
- Fair Isle SPA
- Developed beaches
- Embankments
- Harbour areas

Figure B1.3
VMS Data around Fair Isle

Figure B1.4
Figure B1.5

Energy Generation around Fair Isle

- Fair Isle D&R pMPA
- Fair Isle SPA
- Wave Lease Areas
- Tidal Lease Areas
Military Practice Areas around Fair Isle

Figure B1.6

- Fair Isle D&R pMPA
- Fair Isle SPA
- AIAA - Areas of Intense Aerial Activity
- Firing Danger Area and Surface Danger Area

Coordinate System: WGS 1984
Projection: Transverse Mercator
Scale: 1:1,000,000

Military Practice Areas

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Oil and Gas around Fair Isle

Figure B1.7
Ports and Harbours around Fair Isle

Figure B1.8

- Fair Isle D&R pMPA
- Fair Isle SPA
- Disposal Grounds
  - Closed
  - Open
- Ports
- Lerwick Port Authority
- Shetland Islands Council
  - (Port & Harbour Ops)
- Anchor berth
- Anchorage area
Power Cables around Fair Isle

Figure B1.9
AIS Transit Lines (2012) around Fair Isle

N.B. Composite plot of 42 days of AIS-A and AIS-B data in 2012 for the following periods: 3-9 Jan and 1-7 Mar, May, Jul, Sept and Nov 2012 (MMO, 2014)
Fig B1.14_FI_Water_Sports.mxd

Water Sports around Fair Isle

- Fair Isle D&R pMPA
- Fair Isle SPA
- Climbing Routes
- Popular Dive Sites
- Sea Angling
- Beach Access
- Kayaking
- Popular Dive
- Rowing
- Sailing Race
- Surfing
- Windsurfing

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Date
Dec 14

By
FMM

Size
A4

Version
1

Coordinate System
WGS 1984

Projection
UTM Zone 30N

Scale
1:1,000,000

QA
NMW
B.2 Fair Isle - Socio-economic Assessment

B.2.1 Site Summary

Table 1. Summary of Features

<table>
<thead>
<tr>
<th>Features</th>
<th>Data Source</th>
<th>Survey Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Habitat Features</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlantic and Mediterranean high/moderate energy infralittoral rock</td>
<td>Modelled (EUSeaMap)</td>
<td>N/A</td>
</tr>
<tr>
<td>Atlantic and Mediterranean high/moderate/low energy circalittoral rock</td>
<td>Modelled (EUSeaMap)</td>
<td>N/A</td>
</tr>
<tr>
<td>Sublittoral coarse sediment</td>
<td>Modelled (EUSeaMap)</td>
<td>N/A</td>
</tr>
<tr>
<td>Kelp beds</td>
<td>Survey (GeMS database)</td>
<td>1987, 2011</td>
</tr>
</tbody>
</table>

**Species Features**
Basking shark, Black guillemot, Grey seal, Harbour/common seal, Harbour porpoise, Ling, Saithe, Sandeels.

Site Description
The Fair Isle D&R MPA proposal is situated around Fair Isle, midway between the southern tip of Shetland Mainland and the northernmost Orkney island, North Ronaldsay.
### Table 1. Summary of Features

<table>
<thead>
<tr>
<th>Species</th>
<th>Survey Method (Database)</th>
<th>Year(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basking shark</td>
<td>Survey (GeMS database)</td>
<td>2006</td>
</tr>
<tr>
<td>Black guillemot</td>
<td>Survey (GeMS database)</td>
<td>1999</td>
</tr>
<tr>
<td>Grey seal</td>
<td>Survey (GeMS database)</td>
<td>2007, 2011</td>
</tr>
<tr>
<td>Harbour/common seal</td>
<td>Survey (GeMS database)</td>
<td>2007</td>
</tr>
<tr>
<td>Harbour porpoise</td>
<td>Survey (GeMS database)</td>
<td>2012</td>
</tr>
<tr>
<td>Ling</td>
<td>Survey (GeMS database)</td>
<td>1987</td>
</tr>
<tr>
<td>Saithe</td>
<td>Survey (GeMS database)</td>
<td>2011</td>
</tr>
<tr>
<td>Sandeels</td>
<td>Survey (GeMS database)</td>
<td>2000, 2006</td>
</tr>
</tbody>
</table>

Note: Data source information (and survey date where applicable) has been presented to provide an indication of data confidence.
### B.2.1.1 Summary of Costs and Benefits

#### Table 2a. Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as a D&R MPA (over 2015 to 2034 inclusive)

<table>
<thead>
<tr>
<th>Human Activity</th>
<th>Cost Impact on Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quantified Economic Costs (Discounted)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Quantified Economic Costs</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Non-Quantified Economic Costs</strong></td>
<td></td>
</tr>
<tr>
<td>Commercial fisheries - management measures not yet defined</td>
<td>Costs cannot be quantified as management measures currently uncertain. Given the low level of existing fisheries activity, it is anticipated that any cost impacts will be minor.</td>
</tr>
</tbody>
</table>

Note: For more detailed information on economic cost impacts on activities, see Table 4.

#### Table 2b. Summary of Social Impacts and Distribution of Quantified Impacts arising from the Designation and Management of the Site as a D&R MPA (over 2015 to 2034 inclusive)

<table>
<thead>
<tr>
<th>Key Areas of Social Impact</th>
<th>Description</th>
<th>Scale of Expected Impact across Scenarios, Average (mean no. of jobs affected)</th>
<th>Distribution Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Location</td>
<td>Fishing Groups Predominantly Affected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Region</td>
<td>Port</td>
</tr>
<tr>
<td>Income and employment</td>
<td>Commercial Fisheries</td>
<td>Very minor</td>
<td>North North-East</td>
</tr>
</tbody>
</table>

Note: For detailed information on socio-economic impacts by sector, see Table 7a. For more detailed information on distributional impacts by sector see Tables 7b and 7c.
### Table 2c. Environmental Impacts arising from the Designation and Management of the Site as a D&R MPA (over 2015 to 2034 inclusive)

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ecosystem Services Impacts</strong> (Moderate and High Impacts)</td>
<td></td>
</tr>
<tr>
<td>Non-use Value of Natural Environment</td>
<td>Moderate - High, variety of protected features, and contribution of the site to MPA network, have non-use value.</td>
</tr>
<tr>
<td></td>
<td>Low positive impact - much of the site is already protected as an SPA. D&amp;R MPA designation may provide greater certainty of protection of additional features. See discussion in Section 3.2.3 of the main report.</td>
</tr>
<tr>
<td><strong>Other Benefits</strong></td>
<td></td>
</tr>
<tr>
<td>Recreation/tourism</td>
<td>Management measures are expected to be minor given the low level of existing fishing activity. Changes in the provision of the ecosystem services will be minor, but there may still be a change in the use of the ecosystem service (e.g. visitors may be attracted to the isle as a result of the MPA designation either for tourism/recreation or to undertake research. Impacts assessed as minor positive.</td>
</tr>
<tr>
<td>Research and education</td>
<td></td>
</tr>
</tbody>
</table>

Note: For detailed information on ecosystem services impacts, see Table 8.
### B.2.1.2 Summary of Overlaps and Interactions Between Proposed Designated Features and Human Activities

**Table 3. Overlaps and Potential Interactions between Features and Human Activities, indicating the need for Assessment of Cost Impacts from Designation of the Site as a D&R MPA**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Aggregates</th>
<th>Aquaculture (Finfish)</th>
<th>Aquaculture (Shellfish)</th>
<th>Aviation</th>
<th>Carbon Capture &amp; Storage</th>
<th>Coastal Protection</th>
<th>Commercial Fisheries</th>
<th>Energy Generation</th>
<th>Military Activities</th>
<th>Oil &amp; Gas</th>
<th>Ports &amp; Harbours</th>
<th>Power Interconnectors</th>
<th>Recreational Boating</th>
<th>Shipping</th>
<th>Telecom Cables</th>
<th>Tourism</th>
<th>Water Sports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fair Isle</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<td>✔️</td>
</tr>
</tbody>
</table>

*Note: A normal font tick (✔️) font indicates that there is an overlap between the activity and the D&R MPA proposal site; a **bold** tick (☑️) indicates that the overlap in a potential interaction between the activity and site has resulted in an assessment of cost impact.*
### B.2.2 Human Activity Summaries

#### B.2.2.1 Human Activities That Would be Impacted by Designation of the Site as an MPA

<table>
<thead>
<tr>
<th>Table 4. Commercial Fisheries</th>
</tr>
</thead>
</table>
| In the inshore waters around Fair Isle, there is a fishery for shellfish (crab and lobster), and there are some records of demersal trawl activity (Figure B1.4). The Shetland Marine Spatial Plan indicates some demersal fishing effort around Fair Isle, mainly to the south and east of the island; and shellfish creel fishing grounds, mainly to the north and east of the island (Shetland Islands Council & NAFC, 2013). Most shellfish fishing takes place inshore, and there are negligible levels of fishing activity outside the Shetland Shellfish Management Area (6nm) (Robinson and Leslie, 2010). Boats fishing inshore are few and irregular, and the proposed D&R MPA area is not heavily fished at present (FIMETI Clarifications doc). A Shellfish Regulating Order was established for Shetland in 1999, managed by the Shetland Shellfish Management Organisation (SSMO). Boats operating for shellfish within the designated Order zone have to be licensed by the SSMO, based on a track record of shellfishing in Shetland waters. Members of the Shetland Shellfish Management Organisation (SSMO) fish in the area although this is seasonal and weather dependant. No information was received regarding fishing activity in the proposed D&R MPA area from SSMO, as it is SSMO policy not to give out spatial information that might identify individual members (SSMO, pers. comm.).

According to VMS-based estimates, whitefish trawls, whitefish seines, pelagic trawls, other trawls and dredges (over-15m) operate within the area. The value of catches from the proposed D&R MPA area was £0.262 million (over-15m vessels) (£135,700 from pelagic trawls; £35,100 from whitefish trawls and seines; and £90,900 from other trawls) (annual average for 2009-2013, 2013 prices). 31 over-15m vessels were recorded fishing within the proposed D&R MPA area over the period 2009-2013, with only 1 vessel (whitefish trawler) fishing there regularly (3 or more years during the time period). For under-15m vessels, it is understood from SSMO that shellfish potting takes place, but no information was received regarding other under-15m gears. ScotMap data do not cover the Shetland area. Therefore, area-based calculations have been used to estimate the value of landings from the proposed D&R MPA area based on ICES rectangle data. The value of landings from under-15m vessels from the proposed D&R MPA area is estimated to be between £0.010 million and £0.043 million. The former estimate is based on ICES rectangle landings data (47E8 and 48E8), assuming all shellfish catches are taken from within 6nm limits, and pro-rating the value of shellfish landings according to the area of the D&R MPA as a proportion of the 0-6nm area in those ICES rectangles. The latter estimate is based on Shetland statistics of the value of landings of crab and lobster, pro-rata'd by the area of the D&R MPA area as a proportion of Shetland 6nm waters. This is likely to be an overestimate as it assumes that all fishing grounds around Shetland and Fair Isle are of equal importance, but in reality the grounds around Shetland are more intensively fished than those around Fair Isle, which are less accessible.

VMS data indicate that there were no non-UK vessels fishing within the proposed D&R MPA. Surveillance data for 2009 to 2013 did not record any sightings of non-UK vessels fishing within the proposed D&R MPA.

Management measures for the assessment have been developed based on the D&R MPA Proposal. This implies there would be no immediate restriction of commercial fishing activity in the D&R MPA area. Potential future management measures for fisheries have not been assessed. Similarly, the potential future impact on fish processors has not been assessed, but is considered unlikely to be significant.

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VMS data indicate that there were no non-UK vessels fishing within the proposed D&R MPA. Surveillance data for 2009 to 2013 did not record any sightings of non-UK vessels fishing within the proposed D&R MPA.

Management measures for the assessment have been developed based on the D&R MPA Proposal. This implies there would be no immediate restriction of commercial fishing activity in the D&R MPA area. Potential future management measures for fisheries have not been assessed. Similarly, the potential future impact on fish processors has not been assessed, but is considered unlikely to be significant.
## Economic Costs on the Activity of Designation of the Site as an MPA

<table>
<thead>
<tr>
<th>Assumptions for cost impacts</th>
<th>Management measures not yet defined</th>
<th>N’ot applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of one-off costs</td>
<td>None.</td>
<td></td>
</tr>
<tr>
<td>Description of recurring costs</td>
<td>Loss of &gt;15m fishing income (annual values, £ million, 2013 prices): None.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of &lt;15m fishing income (annual values, £ million, 2013 prices): None.</td>
<td></td>
</tr>
<tr>
<td>Description of non-quantified costs</td>
<td>None.</td>
<td></td>
</tr>
</tbody>
</table>

## Quantified Costs on the Activity of Designation of the Site as an MPA

<table>
<thead>
<tr>
<th>Total costs (2015-2034)</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average annual costs</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Present value of total costs (2015-2034)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

## Economic Impacts

<table>
<thead>
<tr>
<th>Total change in GVA (2015-2034)</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average annual change to GVA</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Present value of total change in GVA (2015-2034)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Direct and Indirect reduction in employment</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period.
Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20).
Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.
Total change in GVA (2015-2034) = The change in direct GVA in the sector for the site summed over the 20 year period.
Average annual change to GVA = Total change in direct GVA in the sector for the site divided by the total number of years under analysis (i.e. 20).
Present value of total change in GVA (2015-2034) = Total change in direct GVA in the sector for the site discounted to current value, using a discount rate of 3.5%.
Direct and Indirect reduction in Employment = The average (mean) reduction in direct employment in the sector plus the indirect reduction in employment on the sector’s suppliers.
B.2.2.2 Human Activities That Would Benefit from Designation of the Site as a D&R MPA

Table 5. Human Activities that would Benefit from Designation of the Site as a D&R MPA

<table>
<thead>
<tr>
<th>Activity</th>
<th>Estimated Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourism</td>
<td>Tourism may benefit from the designation of the D&amp;R MPA proposal as an added attraction to the destination and additional researcher visits to the isle. There may also be indirect benefits to tourism as a result of benefits to some water sports activities, for example, diving.</td>
</tr>
</tbody>
</table>

B.2.2.3 Human Activities That Would be Unaffected by Designation of the Site as a D&R MPA

Table 6. Human Activities that are Present but which would be Unaffected by Designation of the Site as a D&R MPA

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports &amp; Harbours</td>
<td>Two harbours are situated within the Fair Isle D&amp;R MPA proposal boundary. However, it is not anticipated that cost impacts will be incurred should the site be designated as no management measures are proposed for this activity.</td>
</tr>
<tr>
<td>Recreational Boating</td>
<td>Several light and medium recreational use cruising routes intersect the Fair Isle D&amp;R MPA proposal boundary. However, it is not anticipated that cost impacts will be incurred should the site be designated as no management measures are proposed for this activity.</td>
</tr>
<tr>
<td>Shipping</td>
<td>Several shipping routes intersect the Fair Isle D&amp;R MPA proposal boundary. However, it is not anticipated that cost impacts will be incurred should the site be designated as no management measures are proposed for this activity.</td>
</tr>
<tr>
<td>Water Sports</td>
<td>There are several popular dive sites located within the Fair Isle D&amp;R MPA proposal boundary. However, it is not anticipated that cost impacts will be incurred should the site be designated as no management measures are proposed for this activity.</td>
</tr>
</tbody>
</table>
### Table 7a. Social Impacts Associated with Quantified and Non-Quantified Economic Costs

<table>
<thead>
<tr>
<th>Sector</th>
<th>Potential Economic Impacts</th>
<th>Economic Costs and GVA (PV)</th>
<th>Area of Social Impact Affected</th>
<th>Mitigation</th>
<th>Significance of Social impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Fisheries</td>
<td>Potential loss of income and employment</td>
<td>Not quantified</td>
<td>Income and employment:</td>
<td></td>
<td>Income and employment: x - likely to be at worst a minor change</td>
</tr>
</tbody>
</table>

Impacts: xxx - significant negative effect; xx - possible negative effects; x - minimal negative effect, if any; 0 - no noticeable effect expected.

### Table 7b. Distribution of Social Impacts for Commercial Fisheries (assuming zero displacement of fishing activity) - Location, Age and Gender

<table>
<thead>
<tr>
<th>Sector/Impact</th>
<th>Location</th>
<th>Age</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Fisheries</td>
<td>Region</td>
<td>Age</td>
<td>Gender</td>
</tr>
<tr>
<td></td>
<td>Rural, Urban, Coastal or Island</td>
<td>Children</td>
<td>Working age</td>
</tr>
<tr>
<td>Commercial Fisheries</td>
<td>North</td>
<td>x</td>
<td>0</td>
</tr>
<tr>
<td>Reduction in landed value, GVA and employment *</td>
<td>North-East</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>x Potential employment impacts in:</td>
<td></td>
<td>x Rural Coastal Island</td>
</tr>
<tr>
<td></td>
<td>Lerwick</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fraserburgh</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kirkwall</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potentially also Norway (large proportion of landings to Norway)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Impacts: xxx - significant negative effect; xx - possible negative effects; x - minimal negative effect, if any; 0 - no noticeable effect expected.

* Based on value of landings by home port affected under intermediate scenario.
Table 7c. Distribution of Social Impacts for Commercial Fisheries (assuming zero displacement of fishing activity) - Fishing Groups, Income Groups and Social Groups

<table>
<thead>
<tr>
<th>Sector/Impact</th>
<th>Fishing Groups</th>
<th>Income Groups</th>
<th>Social groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vessel category</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;15m</td>
<td>&gt;15m</td>
<td>10% most</td>
</tr>
<tr>
<td>Commercial Fisheries</td>
<td>uncertain</td>
<td>uncertain</td>
<td>0</td>
</tr>
</tbody>
</table>

Impacts: xxx - significant negative effect; xx - possible negative effects; x - minimal negative effect, if any; 0 - no noticeable effect expected.

* Based on costs to gear types/sectors and vessel categories affected under the intermediate scenario.
### B.2.3 Anticipated Environmental Impacts

Table 8. Summary of Ecosystem Services Benefits arising from Designation of the Site as a D&R MPA

<table>
<thead>
<tr>
<th>Services</th>
<th>Relevance to Site</th>
<th>Baseline Level</th>
<th>Estimated Impacts of Designation</th>
<th>Value Weighting</th>
<th>Scale of Impacts</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish for human consumption</td>
<td>Low - current low fishing effort in D&amp;R MPA area</td>
<td>Where assessed, most stocks not at MSY</td>
<td>Minimal, protection of seabed can contribute to maintenance and recovery of stocks -but stock levels dependent on pressures in wider marine ecosystem and size of local increases uncertain. Management measures also uncertain but likely to be minor, reflecting current low fishing effort.</td>
<td>Low - current low fishing effort in area, although historically supported higher levels of fishing activity</td>
<td>Minimal</td>
<td>Moderate, uncertainty in proposed management measures and response of seabed habitats to management measures.</td>
</tr>
<tr>
<td>Fish for non-human consumption</td>
<td>Stock reduced from potential maximum</td>
<td>Low, extent and condition of relevant benthic features uncertain</td>
<td>Minimal, possible small increase in carbon sequestration and storage as a result of improved condition of benthic features, but management measures likely to be minor.</td>
<td>Moderate, social cost of carbon</td>
<td>Minimal</td>
<td>Moderate - while management measures are uncertain, fishing effort is currently low and therefore any changes would be expected to be small</td>
</tr>
<tr>
<td>Gas and climate regulation</td>
<td>Low - Moderate, via maerl and faunal benthic communities</td>
<td>Low, major water quality issues to be dealt with through WFD</td>
<td>Low, water quality in this area not affecting human welfare</td>
<td>Nil</td>
<td>Increase in this service unlikely to substitute existing water treatment</td>
<td>High</td>
</tr>
<tr>
<td>Natural hazard protection</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Nil</td>
<td>Nil</td>
<td>High</td>
</tr>
<tr>
<td>Regulation of pollution</td>
<td>Low - no significant sources of pollution</td>
<td>Low, major water quality issues to be dealt with through WFD</td>
<td>Nil</td>
<td>Low</td>
<td>Nil</td>
<td>High</td>
</tr>
</tbody>
</table>
### Table 8. Summary of Ecosystem Services Benefits arising from Designation of the Site as a D&R MPA

<table>
<thead>
<tr>
<th>Services</th>
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<th>Baseline Level</th>
<th>Estimated Impacts of Designation</th>
<th>Value Weighting</th>
<th>Scale of Impacts</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-use value of natural environment</td>
<td>Moderate - High, variety of protected features, and contribution of the site to MPA network, have non-use value.</td>
<td>Non-use value of the site likely to be high due to existing SPA and limited human pressures</td>
<td>Low: designation as D&amp;R MPA potentially provides greater certainty of protection of additional features.</td>
<td>Low - SPA is already protected</td>
<td>Low</td>
<td>Moderate, additional value to society uncertain</td>
</tr>
<tr>
<td>Recreation</td>
<td>Moderate - tourism and recreational use locally important to island economy</td>
<td>Low - overall low number of tourists/recreational visitors to isle</td>
<td>Impact to ecosystem service likely to be minimal - management measures not defined but likely to be minor. However, there may be greater use of the ecosystem service as a result of designation - e.g. more visitors attracted to MPA, increased recreational activity.</td>
<td>Moderate - important to island economy,</td>
<td>Minimal</td>
<td>Moderate - management measures likely to be minor</td>
</tr>
<tr>
<td>Research and Education</td>
<td>Moderate - site already important research location</td>
<td>Moderate - site already important research location</td>
<td>Impact to ecosystem service likely to be minimal - management measures not defined but likely to be minor. However, there may be greater use of the ecosystem service as a result of designation - e.g. more researchers attracted to MPA.</td>
<td>Moderate - important to island economy</td>
<td>Minimal</td>
<td>Moderate - management measures likely to be minor</td>
</tr>
<tr>
<td>Total value of changes in ecosystem services</td>
<td></td>
<td>Minimal to Low</td>
<td></td>
<td>Minimal to Low</td>
<td>Moderate to High</td>
<td></td>
</tr>
</tbody>
</table>

R/4276/1 R.2368
Assessment of the Fair Isle Third Party Demonstration and Research MPA Proposal - Criteria and Socio-economic Final Report
B.3 Fair Isle Criteria Assessment

Key: How the proposal fits with the criteria has been judged on the following scale:

- Meets criterion ( );
- Minor additional development required to meet criterion ( );
- Significant additional development required to meet criterion ( ).

B.3.1 Criterion 1

<table>
<thead>
<tr>
<th>Element</th>
<th>Evidence</th>
<th>Considerations</th>
<th>Conformance with Criteria</th>
</tr>
</thead>
</table>
| Criterion 1 - The Aims and Objectives Proposed for the MPA are Feasible | Two main objectives were identified in revised proposal (June 2015): To investigate the factors affecting seabird populations on Fair Isle, particularly climate change impacts and direct human influences. This will be done through:
  - Studying seabird productivity and prey availability (which will also help expand knowledge on inshore fish and invertebrate populations).
  - Exploring the potential for voluntary measures through local management measures in partnership with all stakeholders.
  - To demonstrate the socio-economic benefits of the marine environment and the additional benefits that MPA designation can bring to the community. | The two main objectives relate to carrying out research and demonstration activities relating to sustainable management of the marine environment. | Meets criterion |

Are the aims and Objectives stated above. The study area recognises the current... The objectives have been revised to be...
<table>
<thead>
<tr>
<th>Element</th>
<th>Evidence</th>
<th>Considerations</th>
<th>Conformance with Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion 1 - The Aims and Objectives Proposed for the MPA are Feasible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>objectives clearly specified, and are they appropriate, realistic and feasible (for the size, location and features of the proposed D&amp;R MPA)?</td>
<td>boundary for the SPA (2km) and suggests that for research purposes the R&amp;D MPA boundary (5km) will allow the option for developing the experimental research and management measures to ensure a realistic and fully effective research programme.</td>
<td>more specific. A clear implementation plan has been proposed and the proposal states that the management measures will be determined through consensus from the Steering Committee. The proposed boundary will enable the research to be carried out and offer opportunities to carry out spatial measures e.g. voluntary research both within and beyond the SPA boundary.</td>
<td>Meets criterion</td>
</tr>
<tr>
<td>Does the D&amp;R MPA include the relevant area over which management measures might be required to achieve the proposed aims and objectives?</td>
<td>FIMETI note of June 2015 acknowledges the current boundary of the Fair Isle Special Protection Area (SPA) for Birds (and also acknowledges the 6 nautical mile inshore fisheries boundary). The SPA boundary gives a statutory basis for incorporation within the D&amp;R MPA. However FIMETI believe that the boundary of the proposed D&amp;R MPA, initially for research purposes, should go beyond this 2km SPA boundary to allow the option of developing experimental research and management measures which ensure a realistic and fully effective research programme. Reflecting this there is a suggested 5km Technical Measures Research Area.</td>
<td>The D&amp;R MPA would provide an opportunity to implement management measures within the Technical Measures Research Area outside the SPA. Such measures could provide additional protection to SPA birds and the wider marine environment.</td>
<td>Meets criterion</td>
</tr>
<tr>
<td>Are governance arrangements for the D&amp;R MPA clear?</td>
<td>The revised proposal submitted in June 2015 provides details of the proposed Governance Structure, with differing levels of responsibility, through Executive Level (Steering Committee), Project Management Level (Project Officer Support Team) and Implementation Level (Project Officer and technical input). In addition draft Terms of Reference are provided together with a Participation and Involvement Protocol</td>
<td>The suggested members of the Steering Committee include all relevant bodies. Arrangements of supervision of the Project Officer are clear.</td>
<td>Meets criterion</td>
</tr>
</tbody>
</table>
B.3.2 **Criterion 2**

<table>
<thead>
<tr>
<th>Element</th>
<th>Evidence</th>
<th>Considerations</th>
<th>Conformance with Criteria</th>
</tr>
</thead>
</table>
| Are the aims and objectives appropriate to be pursued through designation as a D&R MPA? (i.e. the objectives cannot be better achieved through other mechanisms/processes, such as voluntary arrangements, sectoral measures e.g. for fisheries, or a Nature Conservation MPA); | Objectives identified above.                                                                                                                                                                                                                                           | A key focus of the proposal is on research and demonstration involving the local community. Such a focus could not be achieved through sectoral measures or designation as a NC MPA. A voluntary approach could be pursued, but with increased risk of failure. The benefits of the Fair Isle proposal are considered to be:  
  • Strong research baseline exists for marine birds - this is essential in order to be able to detect impact of management measures  
  • Good research facilities available on island  
It is recognised that Fair Isle offers some benefits as a D&R MPA location, particularly in relation to the monitoring of long-term change in sea bird populations and responses to climate change. It is currently unclear what management measures might be implemented and thus the extent to | Meets criterion |
|                                                                         | Riddiford & Riddiford 2011 proposal (p22) indicates there is a wide range of well-established and long running research on Fair Isle bird populations which can assist with national planning in the development of management measures for seabird SPAs and in advising the Scottish Government on favourable management of seabird SPAs. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                           |
|                                                                         | Riddiford & Riddiford 2011 proposal (p15) highlights active community knowledge and experience of local seas, long-term research elements in place, good research facilities and partnerships already established with national research bodies and institutions. The Isle is already involved in dissemination and education activities. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                           |
Assessment of the Fair Isle Third Party Demonstration and Research MPA Proposal - Criteria and Socio-economic Final Report

<table>
<thead>
<tr>
<th>Element</th>
<th>Evidence</th>
<th>Considerations</th>
<th>Conformance with Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion 2 - The Proposed D&amp;R MPA is the Best Means of Carrying out the Proposed Demonstration</td>
<td></td>
<td>which monitoring might demonstrate the benefit of such measures. It is recognised that there are other SPAs with marine extensions where management measures might be implemented for which monitoring could be undertaken. There are also other NC MPAs within which fisheries management measures will be implemented for which monitoring programmes could be established. However, it is unlikely that the demonstration and research components of the proposal would be fulfilled at these locations.</td>
<td></td>
</tr>
<tr>
<td>Does the proposal involve development of a new approach or technique, or a new application of an established process (e.g. new ways of working, new management approaches, addressing issues through original research, trialling approaches from elsewhere to determine their applicability in Scotland)?;</td>
<td>Riddiford &amp; Riddiford 2011 proposal (p13) highlights involvement of local community in partnership with research bodies. It suggests the site provides an opportunity to test and implement pilot measures for developing and applying the principles of sustainable use in the marine environment. At the meeting on 29th October 2014, FIMETI indicated that it was the intention to work flexibly with stakeholders to identify the need for and trial management measures. FIMETI (2015) provides a clear framework for identifying and securing agreement to any proposed management measures.</td>
<td>Provides the opportunity to adopt a community led approach to sustainable management, working with all relevant stakeholders. Provides an opportunity for long-term study of relationship between seabirds, prey availability and climate change.</td>
<td>Meets criterion</td>
</tr>
<tr>
<td>Element</td>
<td>Evidence</td>
<td>Considerations</td>
<td>Conformance with Criteria</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
<td>----------------</td>
<td>---------------------------</td>
</tr>
</tbody>
</table>
| Criterion 2 - The Proposed D&R MPA is the Best Means of Carrying out the Proposed Demonstration | Is there good potential for the proposed management measures to be successfully implemented? i.e. is there likely to be good compliance, are enforcement mechanisms available/in place/described/budgeted for/possible to develop?; | Management measures would be developed based on need and through consultation with stakeholders and through the Steering Committee (FIMETI, June 2015). Any measures are likely to relate to fisheries management and monitoring and through the use of voluntary measures. Potential studies include:  
- Development and implementation of Fair Isle shellfish monitoring programme to evaluate impacts of creel fishing on local stock;  
- Use of Fair Isle as a control for a Shetland-wide study of alien species;  
- Socio-economic research the value of marine resource to the Fair Isle community., | Detail of management measures is unclear as they will be based on the specific studies undertaken, they will however be drawn up by consensus of the Steering Committee. The potential studies will follow the Implementation plan. | Minor additional development required to meet criterion. This will occur through implementation of the proposal |
<p>| | Are the impacts of the proposed management measures acceptable? (consideration of environmental, social and economic costs and benefits); | Management measures not defined. | Impacts are unclear, but unlikely to be significant for existing fisheries activity. Implementation of any measures will be by agreement of all parties. Management measures may constrain new fishing opportunities in the future but these will be well recognised at the start of the study and considered accordingly. | Meets criterion |</p>
<table>
<thead>
<tr>
<th>Element</th>
<th>Evidence</th>
<th>Considerations</th>
<th>Conformance with Criteria</th>
</tr>
</thead>
</table>
| Criterion 2 - The Proposed D&R MPA is the Best Means of Carrying out the Proposed Demonstration | In addition they stressed that fisheries management would only occur as a result of a need under a research framework and decided through discussion with stakeholders.  
SFF noted that current fishing activity around Fair Isle was low but expressed concerns about the need to safeguard fishing opportunities for the future (SFF, 24/11/14)  
FIMETI, June 2015 proposal has been seen by all fishing interests and has their support (see meeting 19/05/2015). As stated, all studies will require the consensus of the Steering Committee prior to any implementation and each study will been implemented in a phase way including having a demonstration and trialling, review and enhancement programme in place to monitor performance against the objectives. | Possible management measures are likely to give rise to only minor costs/benefits.  
The management measures will be developed in consultation with relevant stakeholders. This provides an opportunity to optimise the measures.                                                                                                                                                       | Meets criterion |
| Could the proposal be modified to increase benefits/reduce costs while still meeting its aims and objectives? | As above                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                |                           |
### B.3.3 Criterion 3

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<tr>
<td><strong>Criterion 3 - Research Proposed is Scientifically Sound</strong></td>
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<td>Is a clear research hypothesis stated?</td>
<td>One of the objectives of the D&amp;R MPA is ‘To investigate the factors affecting seabird populations on Fair Isle, particularly climate change impacts and direct human influences. This will be done through: a. Studying seabird productivity and prey availability (which will also help expand knowledge on inshore fish and invertebrate populations). b. Exploring the potential for voluntary measures through local management measures in partnership with all stakeholders’.</td>
<td>Research hypothesis is sufficiently clear.</td>
<td>Meets criterion</td>
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<td>Are the management measures clearly defined?</td>
<td>Management measures not defined. Management measures would be developed based on need and through consultation with stakeholders (FIMETI, June 2015). Any measures are likely to relate mainly to fisheries management. The proposal is intended to demonstrate through research and dissemination, the effectiveness of a community-led partnership approach in achieving a programme of sustainable measures to help ensure that the marine environment is in a condition that benefits all stakeholders as fully as possible. (FIMETI, June 2015)</td>
<td>Part of the rationale of the D&amp;R MPA is to test different measures. The management measures will be implemented following agreement of the Steering Committee, which will be formed of the representatives from key areas of interest, thus gaining support from all.</td>
<td>Meets criterion</td>
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<td>Is the research likely to result in meaningful and measurable outcomes?</td>
<td>FIMETI (2015) has identified a number of potential studies which include: • A desk study of currently available fish stock data. • Work closely with SSMO, appreciating their remit to monitor the Shetland shellfishery to ensure sustainability, to develop and implement a Fair Isle shellfish monitoring programme (using continued long-term monitoring of seabirds will contribute to understanding of changes in seabird populations. The understanding of the causes of change could be enhanced by additional local monitoring of seabird diets and foraging</td>
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<td>Meets criterion</td>
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| Criterion 3 - Research Proposed is Scientifically Sound | - e.g. trapping rates, individual size and population dynamics) to evaluate impacts of creel fishing on local stock.  
  - Socio-economic research into the value of the marine resource to all stakeholders and its particular relevance to the Fair Isle community well-being, job creation and future socio-economic development.  
  - The use of Fair Isle as a control for a Shetland-wide study of alien marine species and their impact on the natural environment, human structures etc. in partnership with Marine Spatial Plan group.  
  - Ongoing development of a structure and framework for integrating the variety of studies into a cross-sectoral approach. Interpreting within this the various agencies, pressures and impacts on the marine ecosystem and its component parts.  

The remit of Phase 2 (Demonstration and Trialling of Relevant Identified Actions) will include a number of elements that are already in place by FIMETI partners and the community as well as novel opportunities the D&R MPA will present. These might include:  
- Continuation of local shellfish monitoring and development of a sustainable-use management programme based on initial findings.  
- Continuation of fish stock data recording and initiation of methodology-driven monitoring scheme and wider dissemination of the results.  
- Seabird monitoring & research using the protocols and methodology of the national Seabird Monitoring Programme patterns together with information on prey distribution/abundance.  

Given that the research will be carefully chosen and monitored throughout its lifetime, there will be opportunities to modify or cease the study annually if the objectives are not being met. These decisions will be made by the Steering Committee. |
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| **Criterion 3** - Research Proposed is Scientifically Sound | (population counts, provisioning of young, standard watches and sampling for quality and range of fish, feeding rates).  
- Ancillary seabird studies to determine routes and feeding locations using data loggers; and investigation of corpses for causes of mortality including starvation and disease.  
- Constant-effort meteorological data gathering and automatic transmission of results to the UK’s Meteorological Station (including automatic data recorders for a series of sea surface parameters - surface temperature, salinity etc.).  
- Seashore monitoring for biodiversity and climate change indicators of the seashore - a community involvement project, especially the children, through the Fair Isle Wildlife Club.  
- Registration and maintenance of biodiversity records.  
- Extensive recording of fish stomach contents by the community.  
- Annual evaluation by the community of inshore fish populations including species composition, size, distribution and temporal and spatial changes in fish stocks - within the limits of the equipment available on the isle.  
- Registration and maintenance of a cultural, historical and heritage database through the George Waterston Memorial Centre and Museum (an accredited member of the Scottish museum network).  
- Systematic recording of cetacean sightings, including along “transects” by the Good Shepherd crew during frequent ferry trips between Fair Isle and Shetland mainland.  
- Sea Watch Foundation studies.  
- Management measures not defined. |
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<td>Are appropriate monitoring arrangements proposed?</td>
<td>As above</td>
<td>Monitoring programmes have been suggested, however these are yet to be fully defined but will be overseen by the Steering Committee., An implementation plan is in place and objectives have been set.</td>
<td>Meets criterion</td>
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<td>Is baseline monitoring in place against which to monitor the impact of the designations and proposed management measures?</td>
<td>The monitoring proposed will build on the work currently undertaken by SSMO and by the Fair Isle community (FIMETI, 2015)</td>
<td>The requirement for a consensus by the Steering Committee prior to any study commencing will ensure that all relevant information is available.</td>
<td>Meets criterion</td>
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<td>What arrangements are in place for dissemination of research findings?</td>
<td>Riddiford &amp; Riddiford (2011) (p34) identifies robust dissemination mechanisms for existing data collection and commits to ensuring that findings from D&amp;R MPA research would also be disseminated. This is also addressed in FIMETI, 2015, and listed within the Terms of Reference for the Steering Committee.</td>
<td>There is a history of research and demonstration activity in Fair Isle through institutions such as Fair Isle Bird Observatory (FIBO). These arrangements could also be used to support dissemination of D&amp;R MPA research. This would need to be agreed as part of the governance arrangements, and is a requirement of the Terms of Reference.</td>
<td>Meets criterion</td>
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### B.3.4 Criterion 4

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<td>There is a Good Level of Support from Stakeholders</td>
<td>Are those groups most likely to be negatively impacted by the proposal (identified through the socio-economic assessment) supportive of it (or not vociferously against it)?</td>
<td>SFF (24/11/14) felt that revised proposal of 7/11/14 did not provide enough clarity on the management of the site and although they were generally sympathetic they did not feel it currently met the guidelines, especially with respect to the uncertainty around measures. SFF suggested that if the proposal could be improved i.e. with more detail, the fishermen would be willing to be consulted and enter into discussion. A level of concern expressed by SSMO and SFA (meeting 30th October). SFA not opposed in principle but they consider it may set a precedent for designations which have not yet been fully worked up. At the meeting on 19th March 2015 with fishery interest groups there were still some reservations about the lack of clarity in the management measures. However, they were more supportive when the objectives were reduced to less ambitious ones and that they would have a say in the research, monitoring and outcomes. The main sector likely to be affected by management measures is commercial fisheries. While this sector is not vociferously opposed to the proposal, they initially had clear concerns about the lack of clarity around management measures and the extent to which the proposal meets the guidelines. These concerns have reduced with the proposal to form a Steering Committee on which fishing interests will have representation and as a result of clarification of the decision making process. The proposed objectives will also assist the fishing industry to extend its knowledge base. Further work is required particularly to clarify possible management measures and governance arrangements so that commercial fisheries stakeholders can have greater confidence in the proposal.</td>
<td>Meets criterion</td>
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<td>Are people living and working within or close to the proposed D&amp;R MPA supportive of it and/or likely to benefit from it?</td>
<td>Full support from Fair Isle community (Riddiford &amp; Riddiford, 2011) and feedback from island community meeting (29/10/14).</td>
<td>There is clear support from the Fair Isle community. Designation could increase researcher visits and special interest parties, leading to an economic benefit. In addition the community will benefit from the continuation of long term monitoring programmes e.g. that of seabirds, shellfish, meteorology, seashore biodiversity, cetacean sightings. Other benefits will depend on nature of management measures which have not yet been determined</td>
<td>Meets criterion</td>
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<td>Are wider stakeholders (e.g. those likely to benefit from wider ecosystem service benefits) supportive of the proposal?</td>
<td>Riddiford &amp; Riddiford (2011) indicates full support from Fair Isle community, National Trust for Scotland, Fair Isle Bird Observatory, Shetland Marine Spatial Plan Group, Royal Society for the Protection of Birds and Shetland Islands Council</td>
<td>Clear support from wider stakeholders. Designation could increase researcher visits and special interest parties, with economic benefit. The wider community will also gain from the dissemination of the long term monitoring programmes. Other benefits will depend on nature of management measures which have not yet been determined</td>
<td>Meets criterion</td>
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### B.3.5 Criterion 5

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<td><strong>Does the proposed MPA contribute to achieving one or more of the national marine objectives?</strong></td>
<td>The proposal seeks to achieve sustainable management of the seas around Fair Isle. In particular, it seeks to further scientific understanding of the causes of change in Fair Isle seabird populations and to explore how management of local pressures from commercial fishing activity might mitigate adverse changes.</td>
<td>The proposal contributes to many of the High Level Marine Objectives (HLMO) including particularly: sustainable use of marine resources (HLMO2), involvement of island community (HLMO9), living within environmental limits (HLMOs 11-13), involving stakeholders in decision-making (HLMO14), using sound science (HLMOs 19-20).</td>
<td>Meets criterion</td>
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<td><strong>Is the proposal consistent with wider Scottish national priorities?</strong></td>
<td>A condition in the Council of Europe Diploma, requires that Fair Isle is designated as an MPA by 2015.</td>
<td>Designation as an MPA would support this requirement.</td>
<td>Meets criterion</td>
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### B.3.6 Criterion 6

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| Criterion 6 - The Proposed Demonstration has a High Value in Terms of Helping to Improve our Knowledge and Understanding | Does the proposal address a key knowledge gap in sustainable methods of marine management or exploitation, or provide a key trial of a method established elsewhere to determine its applicability in a Scottish context? | The proposal is intended to provide a research platform and test bed for management measures improving knowledge and with implications for sustainable management in other coastal areas (FIMETI 7/11/2014). The benefits to the wider community include (FIMETI, June,2015):  
- Exploring a model for collaborative management (co-management) of the marine environment and demonstrating how coastal communities can involve themselves in local management.  
- Demonstrating that investing funding and resources into co-managed sites is a sound investment for government departments.  
- MPAs are widely viewed as being in place for nature conservation but they can also contribute to the improved management of other interests. Pioneering the D&R model could demonstrate to other interest groups a positive process within which gains are to be made from the establishment of MPAs rather than the usual perception of loss.  
- The habitats around Fair Isle are representative of a large number of Northern Isles and coastal Scotland areas so biological results here are likely to be more widely applicable.  
- Fair Isle being used as a potential control site for alien species. | Long-term monitoring could improve knowledge of relationship between seabirds, prey and climate change.  
The proposed management measures have not yet been defined, however the planned approach and establishment of a Steering Committee will ensure consensus of the objectives of the study prior to commencement. Points of review and assessment will ensure that the aims are met and provide the opportunity for the research to be altered to be meaningful and applicable elsewhere. | Meets criterion |

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<tr>
<td>Criterion 6 - The Proposed Demonstration has a High Value in Terms of Helping to Improve our Knowledge and Understanding</td>
<td>Do the lessons learnt from this demonstration proposal have the potential to be applied more widely in Scottish waters?</td>
<td>Lessons learnt may be applicable to other situations particularly seabird SPA management and sustainable management of island and peripheral coastal communities</td>
<td>Meets criterion</td>
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Appendix C

Value Transfer Methodology
C. Value Transfer Methodology

C.1 Approach Taken

This appendix discusses the potential to put a monetary value on the impacts of the proposed designation of the Fair Isle D&R MPA. The approach taken in this short desk-based study involves value transfer. This involves transferring estimates of economic impacts from a site where a study has already been completed to the site of interest. The values transferred from the study site could have been measured using one or more different valuation techniques. Although not an economic valuation method per se, value transfer has the advantage of being quicker and cheaper than undertaking original primary economic valuation research. Where transfer is informed by more than one suitable study, it can also be more robust. Value transfer involves searching for and selecting economic value (cost and benefit estimates) evidence from the literature, and then adjusting them, as necessary, for use in assessment of the site of interest (eftec, 2010).

C.2 Evidence Used

The main paper of relevance to the Fair Isle site is Kenter et al (2013) on the value of potential marine protected areas in the UK to divers and sea anglers. This analysis covered anglers and divers use values for tourism and leisure activities, and their non-use values for habitat protection (related to the cultural service from biodiversity existence, and/or supporting services from biologically mediated habitat). It looked at the recreational and non-use value of the UK MPA and MCZ network. It provides an insight into the value of biodiversity and various habitats in delivering cultural ecosystem services. The report valued over 100 potential sites, including 25 Scottish potential Marine Protected Areas (pMPAs) using travel cost and choice experiment methods to derive annual recreation values, and the contingent valuation method to estimate the non-use value of protecting sites.

The report estimates these values under four benthic protection scenarios. Attributes for the choice experiment included marine landscape, based on grouped habitat categories derived from a combination of English MCZ habitats, Features of Conservation Interest (FOCI) and Scottish MPA 'search features', and hence readily align to the habitat categorisations used for actual MPA site. Kenter et al. use the hypothetical values derived from the survey to estimate the value of actual MPA/MCZs using a matrix approach. The recreational and non-use values identified can be used to estimate the value of removing abrasion pressure from benthic habitats.

The results from Kenter et al. (2013) are provided in separate models for anglers and divers. The main findings from the study are as follows (note, WTP = willingness to pay):
Amongst divers, knowing that species would be protected, even whilst the chance of encountering was very low, was highly valued (WTP £0.44 per species) as was the presence of large fish (WTP £7.64); and

Preferences for habitats were evenly spread with more habitats being favoured by divers than anglers.

C.3 Value Transfer

The values from Kenter et al (2013) can be transferred to the proposed and Fair Isle D&RMPA in the following ways:

- The study indicates that recreational users of the Scottish marine environment have a significant positive non-use value for measures that establish MPAs for the purposes of species and habitats conservation. For the 25 sites that Kenter et al assessed in Scotland, they identified that protection would generate a total one-off non-use value of £125 - 255 million, approximately £5.3 to £9.5m per site. While there are existing designations at Fair Isle, the D&R MPA designation would extend the area covered by existing designations and increase the range of features protected. To the extent that Fair Isle will contribute to expanding such a network of sites, it can thus be identified as having a significant positive value equivalent to some small increment on this total.

- At Fair Isle, the uncertainty surrounding the proposed management measures makes quantification of impacts difficult. It is noted that even if ecosystem service provision does not increase, there may be an increase in use of the ecosystem for recreation/tourism as a result of further designation.

- For Fair Isle the main impact of the designation may be to increase the certainty of the value of protection of the site. For Scotland the average non-use valuation identified per site by Kenter et al. was £5.3-9.5 million. It is uncertain the extent to which such a value applies to a site like Fair Isle. On the one hand, its iconic status as an island could mean it has a higher than average value. On the other hand, its remoteness and relatively low numbers of visitors mean it could have a lower than average value. However, Kenter et al (2013) noted that various sites that they could not assess using the travel cost method due to lack of data on visitor numbers, such as Fetlar to Haroldswick (also on Shetland), still had considerable non-use values.

The existence of the Fair Isle MPA is estimated to have a value of £5.3-9.5m, and the designation would serve to protect this value. These values are in line with much larger values identified for UK marine protection measures (e.g. Dickie et al, in prep).
C.4 References


