

Scottish Government

# **Impact Assessment of the Proposed Designation of Two Inshore Special Areas of Conservation in the Sound of Barra and East Mingulay**

**Final Report**



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Mingulay  
Final Report  
October 2010

**Halcrow Group Limited**

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### Contents Amendment Record

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# 1

## Introduction

### 1.1

#### ***General policy background***

#### 1.1.1

Marine nature conservation in Scotland is promoted as part of a wider set of government policies on the marine environment. The key principles that underpin these policies include sustainable development, integrated management, conservation of biological diversity, robust science, stakeholder involvement and the precautionary principle. The actions to achieve the vision of protecting Scotland's marine biodiversity focuses on the three pillar approach to marine conservation relating to species conservation, site protection and wider seas measures.

#### 1.1.2

The emphasis has been on providing protection to those species and habitats considered under threat or in decline, but this has been changing with more recent moves to adopt an ecosystem approach, which integrates and manages the range of demands placed upon the environment, such that it can indefinitely support these demands without deterioration.

#### 1.1.3

The main impetus for increasing the level of nature conservation in Scotland has been the Habitats Directive (Directive 92/43/EEC) issued within the European Union (EU). The Habitats Directive includes a requirement to establish Special Areas of Conservation (SAC) for a number of listed habitats and species on land as well as in areas of the sea under the jurisdiction of Member States. These SACs, together with Special Protection Areas (SPA) designated under the Birds Directive (Directive 79/409/EEC), contribute to the European *Natura 2000* network, an EU wide network of nature protection areas. The *Natura 2000* network forms the cornerstone of the EU's nature conservation policy.

#### 1.1.4

There is currently recognition that greater effort needs to be made in order to protect marine biodiversity and geodiversity especially given the increasing level of international commitments being made and the acceptance of trans-boundary features of the marine environment (i.e. lack of terrestrial like boundaries). Consequently, in addition to SAC and SPA, whose key objective is to protect specific habitats and species, the recent Marine (Scotland) Act and the UK Marine and Coastal Access Act include a range of measures to further improve the management and protection of UK and Scottish seas through more

comprehensive, holistic and ecosystem based methods so as to ensure their sustainability for current and future generations.

1.1.5

These Acts have therefore included the introduction of new tools for conservation of marine wildlife that together with existing ones such as SAC and SPA can

- (a) halt the deterioration in the state of the UK marine biodiversity as a whole
- (b) promote recovery where practicable
- (c) support healthy functioning and resilient marine ecosystems
- (d) ensure environmental considerations are at the heart of the decision-making processes
- (e) provide mechanisms that can deliver current and future European and international conservation obligations.

1.1.6

Specifically, the above measures will include new marine protected area designations such as Marine Protected Areas (MPA), which will exist alongside the existing Natura 2000 Sites (SAC and SPA) to form a network of marine protected areas so as to effectively protect biodiversity and geodiversity. Crucially, the network will contribute to Scotland's agreement with international partners to create an ecologically coherent network of well managed protected areas in the North East Atlantic.

1.2

***Development of Natura 2000 Network in Scotland***

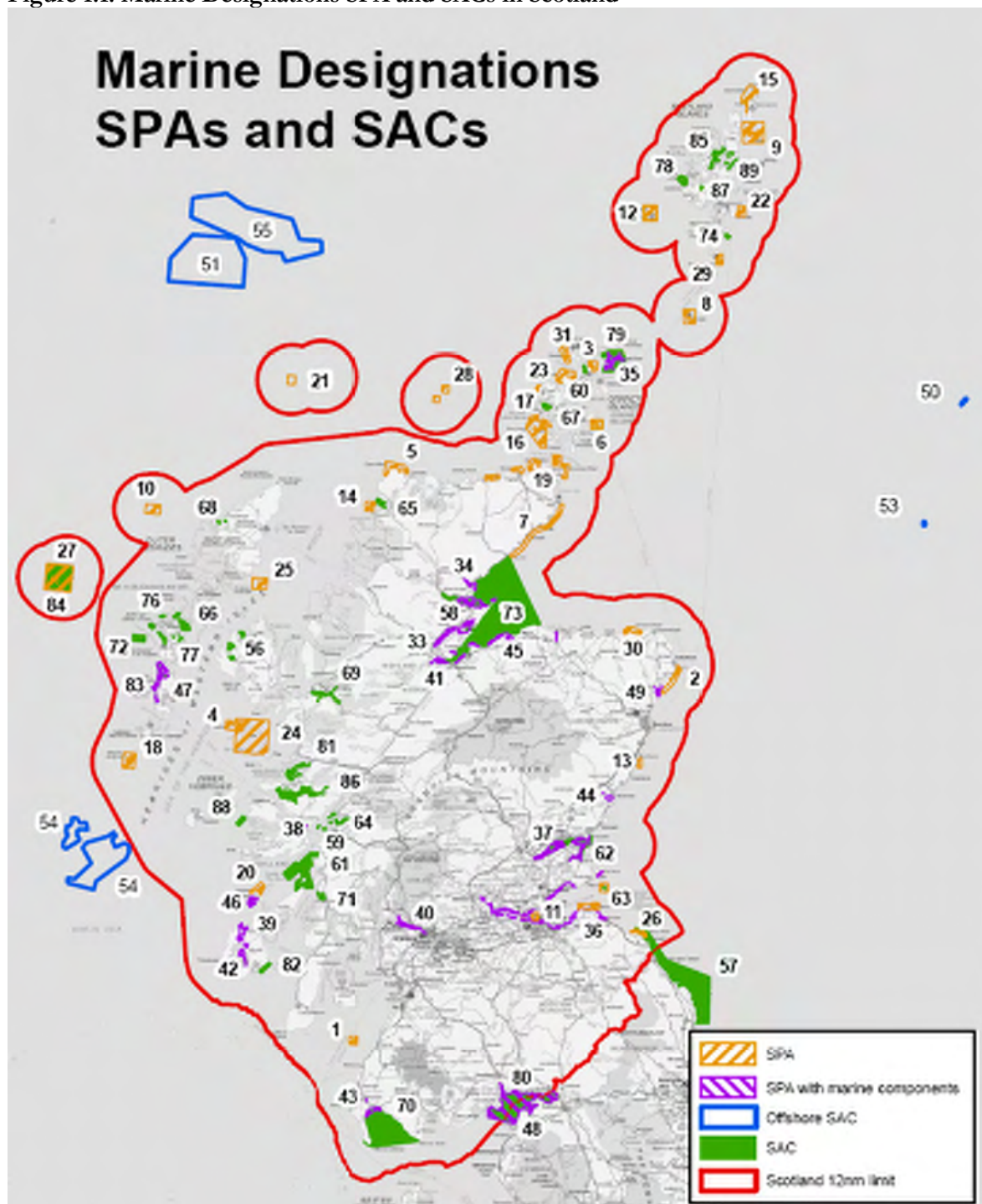
1.2.1

In Scotland, at the end of March 2010, there were 239 SACs and 147 SPAs. These sites protect 79 bird species, such as Golden Eagle and Capercaillie, 18 other types of animal species, including harbour and grey seals, bottlenose dolphin and wild Atlantic salmon, and 56 types of habitat, including reefs, Scotland's rugged upland habitats and machair.

1.2.2

There are currently 34 SACs in Scottish territorial waters (within the 12nm limit) and 6 offshore SACs, which provide protection of marine and intertidal features. In addition to these SACs, there are a further 49 SPAs in Scottish territorial waters which provide protection to seabirds. Of these, 31 include habitat protection below mean low water spring tide, while 18 cover coastal and intertidal areas. All of the current SPA and SAC marine designations in Scotland are set out in figure 1.1 below. Details of the names of each of the sites specified can be found in appendix A.

Figure 1.1: Marine Designations SPA and SACs in Scotland



Source: Marine Scotland

1.2.3 The Natura 2000 network providing protection for marine and intertidal habitats and species is close to completion although there is still more to do to fully implement Natura obligations in Scotland's marine environment and meet the requirements of both the Birds Directive and Habitats Directive. The proposals to designate the Sound of Barra and East Mingulay as SACs are part of this process. Details of other work to complete the network can be found at the JNCC website<sup>1</sup>. The Sound of Barra is being considered for reef, subtidal sandbank habitats and harbour seals, while East Mingulay is being considered for its reefs, particularly coldwater coral reefs.

1.3 ***Background information on the impact assessment***

1.3.1 It is the purpose of this study to contribute to the delivery of Impact Assessments for two SAC proposals at the Sound of Barra and East Mingulay. While the decision to designate the sites will be solely based on scientific evidence to meet the obligations under the Habitats Directive, Scottish Ministers wish to understand the costs and benefits of designating the areas and the potential management measures that may be needed to achieve their conservation objectives. Therefore, the main objective of the study is to provide Scottish Ministers with a clear understanding of the main activities being undertaken within the proposed sites so as to better understand the possible socio-economic impacts and inform the planning of future management practices should both areas be designated as SAC.

1.3.2 This impact assessment covers three principal policy options:

- Option 1: No designation of the sites (Do nothing)
- Option 2: Designation of both sites with no change to level and intensity of current activities and possible restrictions to future activities
- Option 3: Designation of both sites with potential changes to current activities and possible restrictions of future activities

1.3.3 Option one is the “do nothing” scenario and can be considered to be the baseline position against which the potential costs and benefits of other options can be compared.

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<sup>1</sup> Details can be found at <http://www.jncc.gov.uk/page-3053>

- 1.3.4 The second option would envisage the formal designation of the two SAC sites. This would require that any future plans or projects which are being proposed in or adjacent to the two sites which are likely to have a significant effect would undergo an Appropriate Assessment. This means that these future plans and projects can only be authorised if it can be ascertained that there will be no adverse effect on the integrity of the site. This process is sometimes referred to as the Habitats Regulations Appraisal (HRA). If the absence of adverse effects on site integrity cannot be ascertained beyond reasonable scientific doubt, the development proposal can only go ahead if there are no alternative solutions and there are imperative reasons of over-riding public interest to proceed.
- 1.3.5 Option 2 would not require any changes to the current type of activities being undertaken or the level of exploitation of the current activities (such as the fisheries catch and the aquaculture output) on the basis that all current types and levels of activities are compatible with the maintenance of the habitats and species for which the sites are designated. For example, the current level of catch (in tons per year) and intensity (in days of year) would not change as a result of designation. Option 2 can therefore be considered to be the “Do minimum” option arising from the designation of the sites.
- 1.3.6 On the other hand, Option 3 would consider if changes are needed to the current types of activities being undertaken and their level and intensity. This would be required if any current activities were considered to be preventing the site’s conservation objectives from being achieved and leading to deterioration of habitats and/or significant disturbance of species. As in the case of option 2, any future plans and projects would also require to be assessed an accordance with the HRA process outlined above.
- 1.3.7 Options 2 and 3 would need to consider the active management of the designated sites including for instance the implementation of new or revised rules and regulations, the development and implementation of monitoring plans to check on the success or otherwise of introduced measures.
- 1.3.8 The overall methodology for assessing costs and benefits is based on the approach adopted by the Joint Nature Conservation Committee (JNCC) in the course of their most recent marine SAC Impact Assessments. An agreed framework is proposed to combine and assess cost and benefit information from different sources on the likely impacts of the different policy options in the evidence base.

#### 1.3.9

The framework involves a description of:

- What the current situation at the sites is, such as site features, economic activities, management regimes, etc;
- What changes to these, relative to the baseline, are expected to result from the management measures required to meet the sites' objectives;
- What the direct and indirect economic costs of those changes might be to operators, enforcement authorities and wider society;
- What the benefits of those changes might be; and
- The different data that can be used to capture costs and benefits, including market, monetisable non-market and other non-monetisable impacts.

#### 1.3.10

The remainder of this report presents the findings from the study. Following this introductory chapter, chapter two presents a summary of the ecological aspects (the current baseline) of the two proposed sites. Chapter three presents an overview of current and future economic activities associated with the study area. This is based on a review of existing data sources combined with primary data captured through an extensive programme of face to face and telephone based consultations with local business and community representatives within Barra and South Uist as well as with a range of wider stakeholders. An outline of the stakeholders consulted as part of the study is included in appendix A.

## 2 Background information on the sites

### 2.1 *Introduction*

2.1.1 This section provides an overview of the ecological aspects of the two SAC proposals in the Sound of Barra and East Mingulay, based on existing research undertaken in the study areas. Much of the information summarised below is taken from Harries et al (2007), Davies et al (2009) and the formal scientific advice provided to the Scottish Government from Scottish Natural Heritage (SNH)<sup>2</sup>. The information in this section does not replace formal advice prepared by SNH.

### 2.2 *Sound of Barra*

#### *Overview*

2.2.1 The Sound of Barra comprises a mixture of islands, extensive rocky reefs, sandbanks and shallow channels in a broad stretch between the southern end of South Uist and the north eastern shore of the island of Barra in the Outer Hebrides. Most of the Sound shows depths of between 5 and 10 m with a gradual increase in its eastern sector with a few pockets with depths of between 20 and 30m. The complex topography, diversity of habitat types and fast tidal streams have created an area of high biodiversity interests.

2.2.2 A small part of Barra is already designated as a Natura 2000 site. This relates to the Eoligarry SPA, which qualifies under Article 4.1 of the Birds Directive (79/409/EEC) by supporting significant populations of Corncrake (*Crex crex*) as listed on Annex I. It is a 144 hectare site located at the northern tip of the island which comprises sand dunes, cultivated machair and croftland, with small areas of wetland and rough pasture. The habitat supports a breeding population of corncrake of European importance (28 individuals representing at least 5.8% of the breeding population in Great Britain). This site is a non-SSSI SPA classified specifically for this species and site occupiers can apply for financial support

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<sup>2</sup> The full details of the site selection documents produced by SNH in August 2009 in relation to the Sound of Barra and East Mingulay and the other documents referred to are specified in Appendix B



through the Scottish Rural Development Programme (SRDP) for corncrake management<sup>3</sup>.

2.2.3 The Sound of Barra was consulted on as a possible SAC for Harbour seals (*Phoca vitulina*) and sandbanks in 2000 and subsequently re-surveyed in 2006 for Annex I habitats, to quantify areas of habitat which were of European importance. As a result, a wider area is being proposed for a range of habitats and species as found in Annexes I and II of the Habitats Directive: Annex I habitat “sandbanks which are slightly covered by sea water all the time”; Annex I habitat “reefs”; and Annex II species “harbour seal”.

2.2.4 Features of the Annex I sandbank habitats includes *Zostera* spp seagrass beds (~360 ha), Maerl (red algal) beds as well as a range of species associated with sand sediments (e.g. burrowing fauna of worms, crustaceans, bivalve molluscs and echinoderms) and mobile epifauna at the seabed surface (e.g. shrimps, sea snails, crabs and fish). These features contribute to the area’s richness in marine biodiversity.

#### *Site suitability as an SAC*

2.2.5 **Sandbanks** : Degree of representativity, area of qualifying habitat and consideration of structure and function can be summarised as follows:

- All of the sandbanks which are slightly covered by sea water all the time fully meet the definition of habitat type H1110 (sandbanks).
- All four sub-types of subtidal sandbanks (H1110) are present within the Sound of Barra.
- The Sound of Barra contains approximately 7,700ha of qualifying subtidal sandbanks (H1110), and 0.4% - 0.1% of the estimated UK resource for this habitat.
- There were 15 Sandbank biotopes recorded within the Sound of Barra during the 2006 surveys, representing a diversity of sandbank subtypes, ranging from impoverished and muddy sands to gravelly and clean sands, from sheltered eelgrass *Zostera marina* beds to deeper, exposed Maerl beds.
- Extensive (~360ha) *Zostera* seagrass beds are present although their density is often low. There is human influence within the Sound that may

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<sup>3</sup> Full site details can be found at [http://gateway.snh.gov.uk/portal/page?\\_pageid=53,910305,53\\_910314&\\_dad=portal&\\_schema=PORTAL&PA\\_CODE=8495&NEW\\_WINDOW=false](http://gateway.snh.gov.uk/portal/page?_pageid=53,910305,53_910314&_dad=portal&_schema=PORTAL&PA_CODE=8495&NEW_WINDOW=false)

cause further change, but despite considerable change in the distribution of seagrass beds between 2001 and 2006 there has not been any overall decline in abundance of this habitat.

- Probably the most extensive area of Maerl beds (~902ha) identified within the UK series to date is present within the Sound. Although the abundance of live Maerl beds is sparsely distributed, this habitat still provides a complex niche for a diverse group of species.
- The structure and function of the Sound of Barra sandbanks are considered good.
- The nearest sites of this qualifier are Loch nam Madadh and the Sound of Arisaig. The Sound of Barra extends range representation by some 60km.

2.2.6 **In the light of the above, the Sound of Barra is considered by SNH to be of global B grade (good value) for this habitat (sandbanks which are slightly covered by sea water all the time).**

2.2.7 **Reefs:** - degree of representativity, area of qualifying habitat and consideration of structure and function are summarised as follows:

- All Reefs fully meet the definition of habitat type H1170.
- The Sound of Barra contains approximately 5,150ha of qualifying reefs (H1170), and 0.07% of the estimated UK resource for this habitat.
- There were 19 qualifying reef biotopes recorded within its boundary during the 2006 surveys, predominantly 'mosaic' rocky reefs and sediment patches of varying sizes, with kelp on rock and a range of associated faunal diversity.
- The structure and function of the Sound of Barra is good. There is human influence within the Sound, but there is no evidence that the quality of the site has been adversely affected.
- The nearest sites of this qualifier are Loch nam Madadh, Loch Sunart and Lochs Duichs, Long and Alsh. The Sound of Barra extends range representation by some 60km.

2.2.8 **In light of the above, the Sound of Barra is considered by SNH to be of global B grade (good value) for this habitat.**

#### 2.2.9

**Harbour Seals:** - a global assessment of the value of the site for conservation of this species including size and density of population, degree of conservation of the supporting habitat and degree of isolation, can be summarised as follows:

- The Sound of Barra has consistently supported a population of Harbour seals since the 1970's (as recorded by boat-based, breeding season surveys and continued from 1992 by SMRU using aerial surveys during the moulting season).
- The Sound of Barra hosts approximately 0.7% of the total UK inshore population of Harbour seals based on an average calculated from 2002, 2003, 2006 and 2008 counts.
- The degree of isolation within the Sound of Barra is limited, with seal movements occasionally extending to other favoured seal locales.
- The nearest sites of this qualifier are Ascrib, Islay and Dunvegan. The Sound of Barra extends range representation by some 68km.
- The current features of the habitat which are essential for Harbour seals within the Sound of Barra are well conserved.

#### 2.2.10

The Sound of Barra represents therefore an important addition to the UK site series for Harbour seals in terms of geographical range and is the only site for this species in the Western Isles, a region where these seals are significantly distributed. As defined in the Habitats Directive, the maintenance of geographical range is one of the key elements contributing to the achievement of favourable conservation status for a species. It is also one of the additional principles used in the UK to inform the site selection process. These additional principles, outlined on the JNCC website, interpret and supplement the Annex III site selection criteria described above.

#### 2.2.11

**In light of the site's overall assessment and the importance of the species geographical range, the Sound of Barra is considered by SNH to be of global C grade for Harbour seals ('good value').**

#### *Boundary justification*

#### 2.2.12

The boundary of the proposed site was selected by defining the most simple lines that incorporate both the qualifying habitat interests (Reefs and Sandbanks which are slightly covered by sea water all the time) and qualifying habitat that is essential to the life and reproduction of the proposed species Harbour seal *Phoca vitulina* as pupping and moulting areas. This justification has taken into account the need to ensure that the site operates as a functional whole for the

conservation of the habitat type and species and to maintain sensible management units.

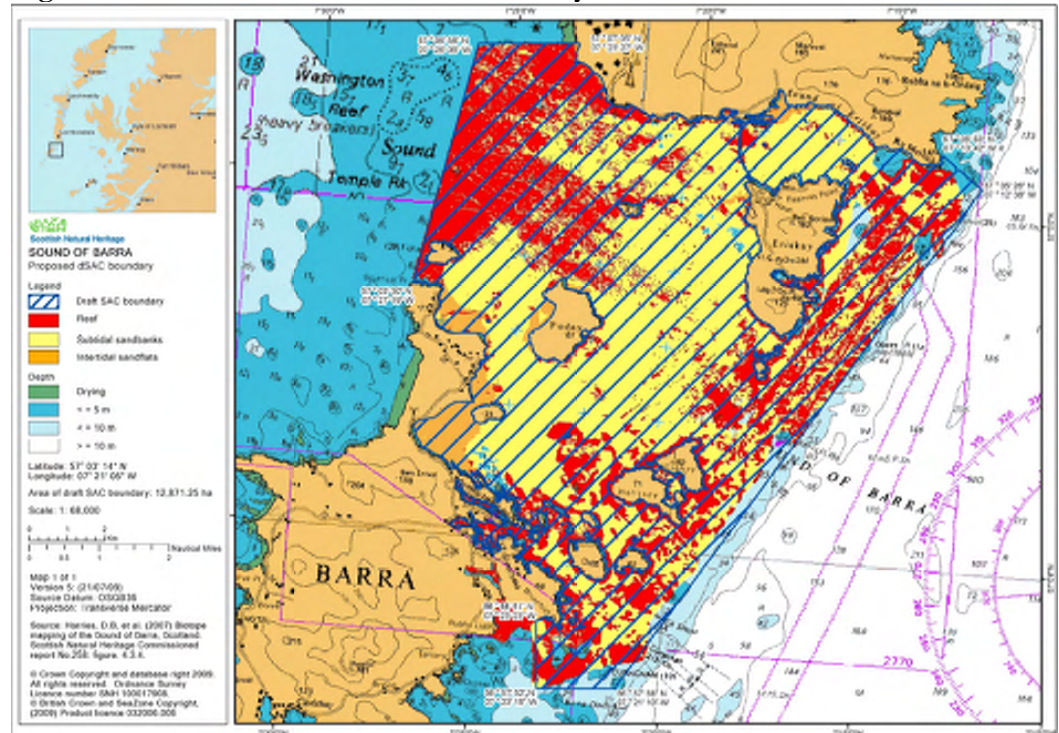
#### 2.2.13

The area now being proposed is more extensive than the originally proposed SAC boundary established in 2000 because it has been recognised that seals will distribute themselves more widely within and around the Sound. In addition, following specific survey work it was recognised that the habitats within the Sound would be an important representation of reefs and sandbanks to the UK marine SAC suite. The known extent of these habitats has therefore been incorporated within the revised boundary being proposed as based on the most robust data now available in line with EU guidance.

#### 2.2.14

The area covered by the SAC proposal (dSAC hereafter) therefore extends from the west of Cenn a Gharaidh on South Uist to Gob Sgurabhail (including Fiairaigh) on Barra, and across to Curachan (island east of Barra) (from a point on land just south of Bruairnis (Rubha Liath)) and Rubha Mealabhaig, including Hairteamul (south-east of South Uist) (Figure 2.1). The boundary will encompass marine areas up to Mean High Water Springs (MHWS) on coastlines i.e. of the main islands as well as smaller islets and skerries.

**Figure 2.1: Sound of Barra draft SAC boundary**



## 2.3 ***East Mingulay***

### *Overview*

2.3.1 The island of Mingulay is situated in the south of the Outer Hebrides. Approximately 13km off the east coast of this island is a reef area that has been located within a trench running North-East to South-West, with depths from approximately 100m at the edges of the trench and approximately 250m at its base.

2.3.2 The island of Mingulay currently benefits from an international designation as part of the Mingulay and Berneray SPA, which regularly supports a population of important European migratory species - razorbills (*Alca torda*) (16,890 individuals, accounting for 2% of the Western European biogeographic population). The SPA also supports a large number of nationally important populations of bird species (regularly supporting over 105,000 seabirds) including Northern fulmar (*Fulmaris glacialis*), European Shag (*Phalacrocorax aristotelis*), Black-leggged Kittiwake (*Rissa tridactyla*), Common Guillemot (*Uria aalge*) and Atlantic Puffin (*Fratercula arctica*)

2.3.3 The islands are largely covered by maritime grassland, with some machair and heath and, as indicated above, are important breeding sites for a diverse assemblage of seabirds which feed in the surrounding waters of the south Minch, outside the SPA<sup>4</sup>.

2.3.4 In addition to the SPA features described above, Mingulay is also frequently visited by tourists based on Barra as a result of its remoteness, pristine marine environment and surrounding beauty.

2.3.5 The draft SAC designation has benefited from surveys undertaken in 2002 and between 2003 and 2007, which have revealed several biogenic complexes with diverse habitats including reef and rocky reefs with massive sponges and a variety of other associated species. The reefs surveyed approximately 13km to the east of Mingulay are of particular interest as they contain biogenic concretions of a cold-water coral, *Lophelia pertusa*. This species is the dominant reef-framework forming

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<sup>4</sup> Site details are found at

[http://gateway.snh.gov.uk/portal/page?\\_pageid=53,910305,53\\_910314&\\_dad=portal&\\_schema=PORTAL&PA\\_CODE=8545&NEW\\_WINDOW=false](http://gateway.snh.gov.uk/portal/page?_pageid=53,910305,53_910314&_dad=portal&_schema=PORTAL&PA_CODE=8545&NEW_WINDOW=false)

coral in the northeast Atlantic (Roberts et. al. 2005). Three offshore sites have been identified with this type of reef in UK waters (Darwin Mounds, North-West Rockall and Hatton Bank) but is not known to be widely present within the 12nm inshore marine area as an established reef complex. The site at East Mingulay is therefore considered unique in UK inshore waters being the only known area with extensive coldwater coral biogenic reefs of this species.

#### 2.3.6

**Global assessment of reefs** - Degree of representativity, area of qualifying habitat and consideration of structure and function for this habitat are summarised as follows:

- All of the Reefs in the proposed site meet the definition of habitat type H1170.
- The reefs to the east of Mingulay contain approximately 540ha of qualifying *L. pertusa* habitat (H1170) and an approximate area of 2,600ha of elevated mounds, which includes a maximum estimated area of qualifying habitat for all types of reefs.
- A habitat categorisation was adapted for deeper water and 8 major subtypes were recorded (6 reef sub-types, 2 non-Annex I sub-types) within its boundary during the 2003 and 2006 surveys, which included *L. pertusa* biogenic reefs and biodiverse reef fauna on bedrock, boulders and cobbles.
- The nearest sites with reefs as a qualifier are Loch nam Madadh, Loch Sunart and Lochs Duichs, Long and Alsh, although none of these contain biogenic reefs.

#### 2.3.7

The reefs to the east of Mingulay extend the representation of this qualifying habitat by some 85km but are more significantly a major contributor for the range of *L. pertusa* reef by being the only one in UK inshore waters (<12nm), whilst also extending the range of biogenic reefs by some 130km. The mixed substrate of hard rock, cobbles and biogenic reefs (both live coral and dead coral framework) results in a very diverse area, but which in turn provides important habitats and possibly spawning and/or nursery grounds for a wide variety of associated faunal and floral species.

#### 2.3.8

**In the light of the above, the reefs to the east of Mingulay are considered by SNH to be of global B grade for the habitat 'Reefs'.**



### Boundary determination

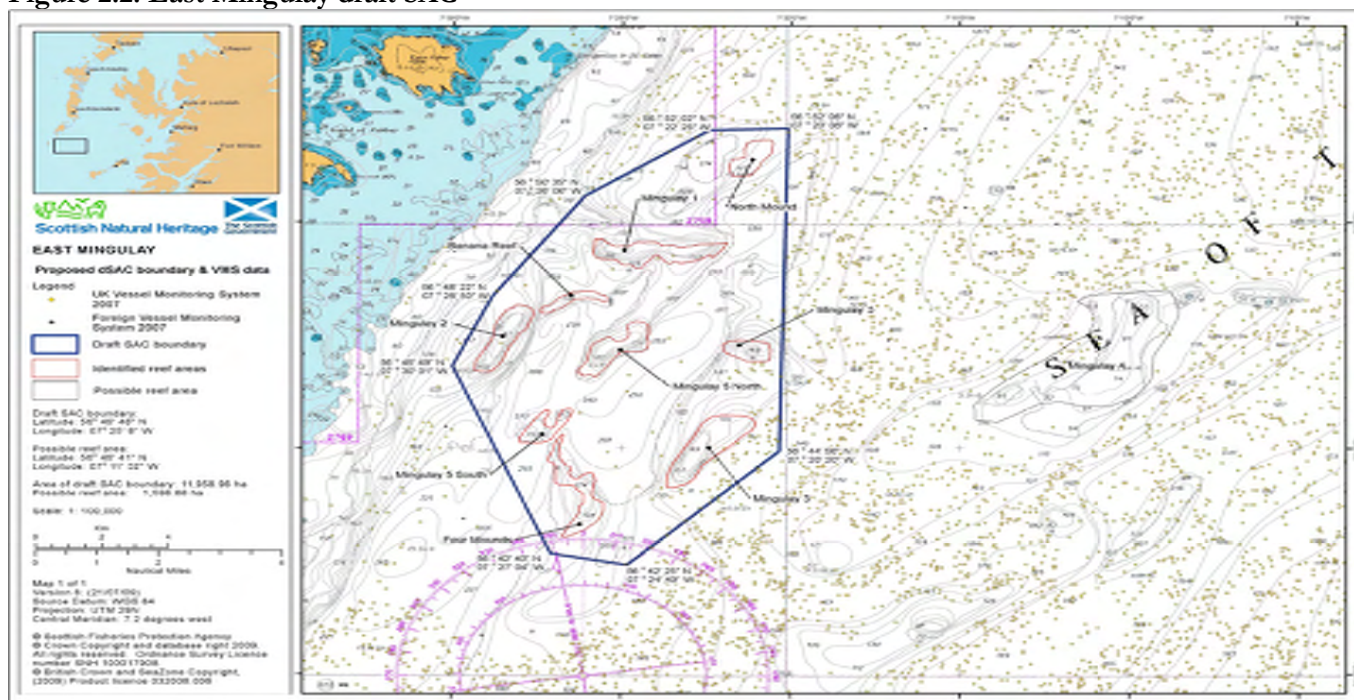
#### 2.3.9

The boundary of the proposed site was selected by defining the simplest lines that incorporate the qualifying habitat interest (Reefs). This has taken into account the need to ensure that the site operates as a functional whole for the conservation of the habitat type and species and to maintain sensible management units. The boundary has been drawn to include the seabed on which the qualifying interests are known to occur while minimising the amount of non-qualifying habitat that is incorporated. The distance from the boundary to the edge of the qualifying interest has been calculated on the basis of a warp length / water depth ratio of 2:1 (SERAD 2001). This is a reasonable approach to ensure that towed gear is not reaching the reef even where the vessel surface position may be outside of the boundary.

#### 2.3.10

Where qualifying interests are at risk from towed fishing gear, the UK have agreed guidelines for inclusion of this margin in the proposed boundary to ensure their protection (JNCC 2004). For example, where water depth within the area of reef is 300m, the boundary will be calculated 600m horizontally from the nearest known reef area. The draft SAC is a wholly marine site off the coast of Scotland (Figure 2.2) and at the time of writing there is only one area being proposed in order to protect the reef complex as a functional whole.

**Figure 2.2: East Mingulay draft SAC**



*2.3.11*

The area marked as possible reef, Mingulay 4, to the east of the draft SAC (dSAC) boundary would require further research before being considered for designation. This is in order to establish the same level of confidence, with regard to the existence of a significant area of biogenic and non-biogenic reef, as the reefs surveyed within the draft SAC boundary.



## 3

## Overview of economic activities

### 3.1

#### *Introduction*

#### 3.1.1

The following section presents information gathered from a number of sources, including primary data gathered during the site visit to Barra and South Uist, documentation provided by SNH and Marine Scotland as well as a review of reports and other documents in the public domain and/or obtained during the stakeholder meetings held during site visits. The economic analysis of the study area will inform the potential impacts of designation and possible management measures in the Sound of Barra and East Mingulay.

### 3.2

#### *Background*

#### 3.2.1

The Sound of Barra dSAC is situated immediately adjacent to the north coast of the Isle of Barra while the East Mingulay dSAC is several miles to the South East of the island (Figure 3.1)

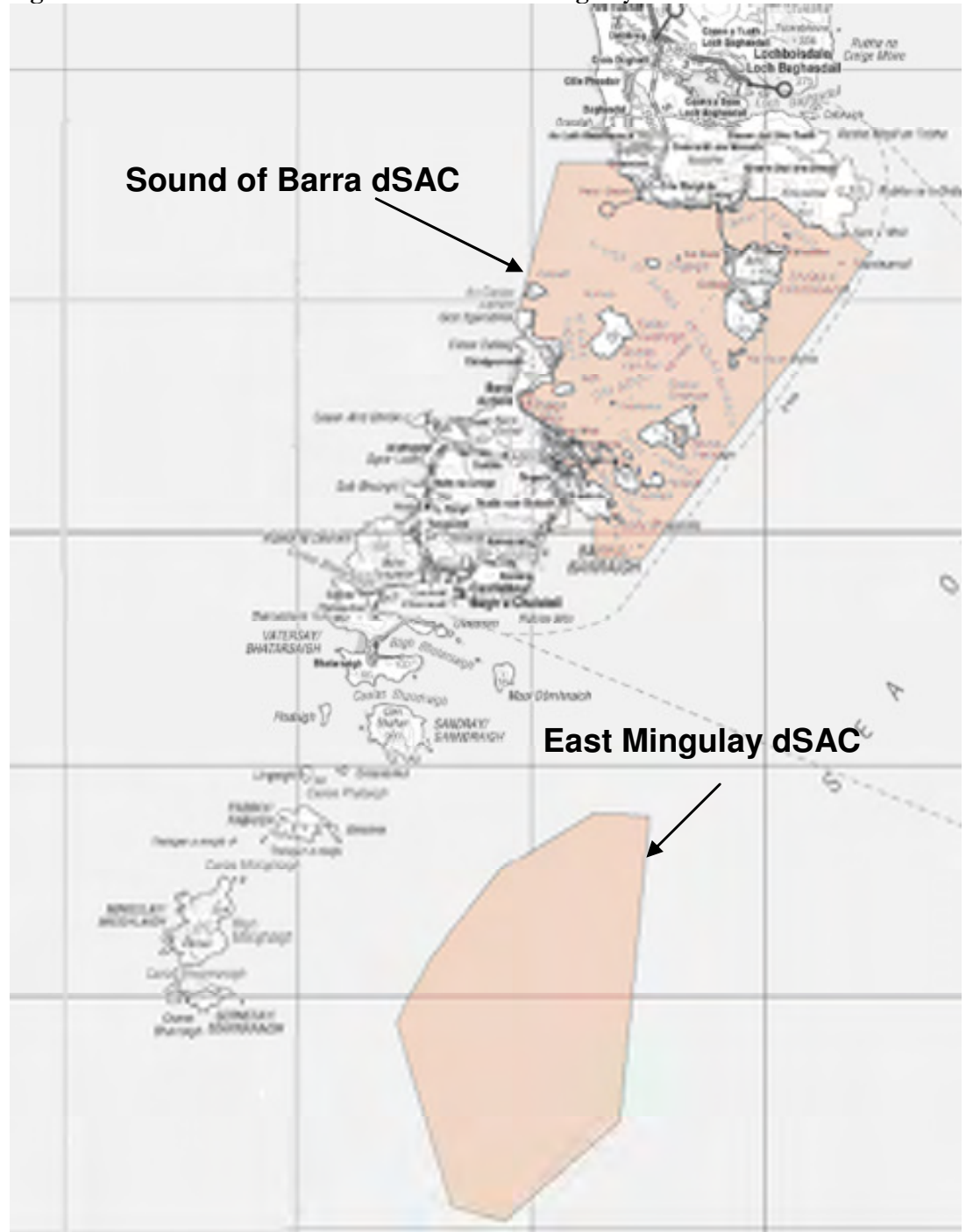
#### 3.2.2

Barra is situated near the southern end of the Outer Hebrides covering an area of 35 sq. miles. The main town is Castlebay, situated in the south of the island from which scheduled ferries operate to Oban on the Scottish mainland, as well as Lochboisdale on South Uist. A scheduled ferry service also operates across the Sound of Barra to Eriskay, which connects to South Uist via a causeway. Scheduled air services to Glasgow and Benbecula operate from the airport located at the beach at Traigh Mhor in the north of the island.

#### 3.2.3

Like many small peripheral island economies, the industrial base on Barra is relatively narrow and is focused on fishing, fish processing, and aquaculture alongside tourism and public services.

Figure 3.1: Location of Sound of Barra and East Mingulay dSACs



- 3.2.4 The fish factory in Northbay is one of the most important private sector employers on the island while the Hebridean Toffee Factory in Castlebay is one of the few manufacturers on Barra. Otherwise, tourism is a principal source of employment for many of the islanders. The tourist season lasts from May to September and thousands of people visit the Island every year with the busiest month being July when the Fèis Bharraigh & BarraFest are held. Outside of the tourism season, islanders often depend on a plurality of occupations (including subsistence fishing and farming) for their livelihoods.
- 3.2.5 Of some importance to the present study is the inter-action of economic factors with local culture and tradition. For many in Barra, traditional values are dominant and the social fabric of the community paramount. Increased regulation in recent years (for example, the SPA protecting the corncrake) has been perceived by many of the local stakeholders consulted as part of this study to have impacted on traditional ways and introduced a sense of being “under surveillance” as well as loss of control over their own decision making. This has created some resistance to further regulatory development which has been identified in the course of stakeholder engagement.
- 3.2.6 These issues and challenges underpin the economic analysis undertaken as part of this study and contribute to our understanding of the potential impacts arising from the principal policy and management options.
- 3.3 ***Review of current economic activities in the study area***
- 3.3.1 Current economic activity has been considered for the following relevant sectors in relation to the study area. This includes:
- fisheries,
  - aquaculture and other marine harvesting
  - tourism,
  - shipping,
  - aggregate extraction,
  - marine renewables
  - offshore cables.
- 3.3.2 Those sectors or elements therein that apply to either the Sound of Barra or East Mingulay are referred to as such, all others apply or concern both sites.

### 3.4

#### 3.4.1

#### ***Fisheries***

The maritime environment is highly important to the Southern Outer Hebrides, as it sustains a significant proportion of the employment in the local economy, either directly or indirectly. A Scottish Government publication of 2005 cites Barra as *one of the travel-to-work areas in Scotland with the highest percentage of its local employment directly provided by the fisheries sector*<sup>5</sup>. This reinforces our own findings which indicate that as many as a quarter of the working population of Barra is involved in fisheries; either directly as fishermen, or working in the fish processing sector, or indirectly in sectors such as administration, transport, equipment maintenance and marketing. This equates to around 200 people within a working population of around 800.

#### 3.4.2

Fisheries have been a major part of the local economy since the 1960's. However, the decline in the pelagic and demersal sectors in recent years has seen a shift to smaller mixed shellfish and demersal boats with activities largely focussed on shellfish for export. Data obtained from Marine Scotland identifies that the total value of the fisheries catch landed on Barra, South Uist and Eriksay in 2009 from all locations amounted to over £3.25m (Table 3.1).

**Table 3.1: Value of fisheries catch landed in Barra and South Uist & Eriskay, 2009**

Species	Barra	South Uist & Eriskay	Total
Nephrops	£1,071,470	£777,262	£1,848,732
Lobsters	£220,695	£311,484	£532,179
Velvet crabs	£100,109	£212,697	£312,806
Edible crabs	£81,771	£195,263	£277,034
Scallops	£52,481	£62,981	£115,462
Other species	£106,632	£57,708	£164,340
<b>All species</b>	<b>£1,633,159</b>	<b>£1,617,395</b>	<b>£3,250,554</b>

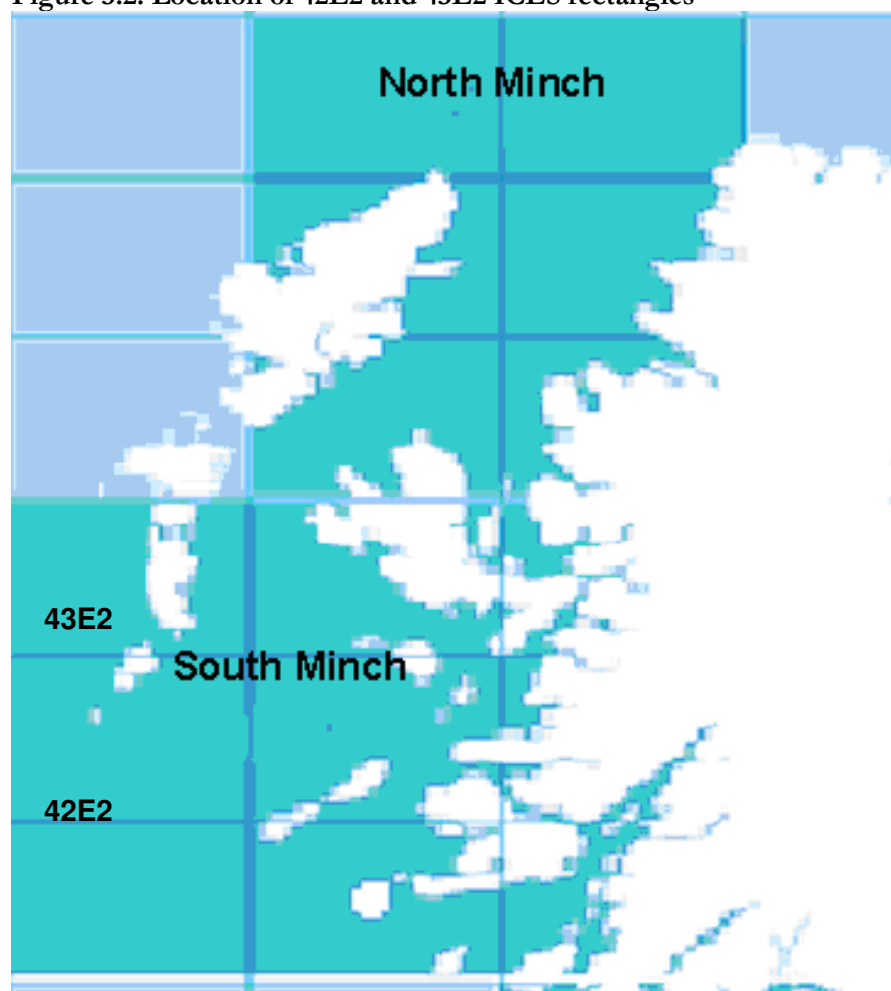
Source: Marine Scotland

<sup>5</sup> Social Change in Scottish Fishing Communities: A Brief Literature Review and Annotated Bibliograph: Scottish Government 2005

3.4.3 The key species landed was nephrops, worth £1.85m accounting for 57% of the value of all landings, substantially higher than any other species. Nephrops is also the most valuable species currently landed in Scotland as a whole.

3.4.4 The two dSACs are located within two ICES (International Council for the Exploration of the Sea) rectangles in the South Minch categorised as 42E2 and 43E2 (Figure 3.2). Data obtained from Marine Scotland indicates that the total value of the catch (fish and shellfish) arising from these two ICES rectangles amounted to an average annual value of £5.18m over the past four years (2006-2009).

**Figure 3.2: Location of 42E2 and 43E2 ICES rectangles**



### 3.4.5

Of the average annual figure of £5.18m, just under half of the value of landings from the two ICES triangles related to creel fishing, which related primarily to nephrops, lobsters and crabs (Table 3.2). The vast majority of the landings by creel fishing related to vessels under 15m (98%), with over half relating to vessels under 10m.

**Table 3.2: Average annual value of fisheries catch from ICES rectangles 42E2 and 43E2**

	<b>Under 10m</b>	<b>10m to15m</b>	<b>Over 15m</b>	<b>All vessels</b>
Pelagic trawling	£0	£9	£38,657	£38,666 <sup>6</sup>
Demersal trawling	£1,429	£17,709	£391,238	£410,376
Shellfish trawling	£25,783	£379,485	£1,444,237	£1,849,504
Shellfish dredging	£3,672	£91,299	£229,253	£324,224
Creel fishing	£1,365,770	£1,131,664	£43,293	£2,540,727
Other	£4,851	£5,388	£8,407	£18,646
<b>Total</b>	<b>£1,401,504</b>	<b>£1,625,553</b>	<b>£2,155,086</b>	<b>£5,182,143</b>

Source: Marine Scotland

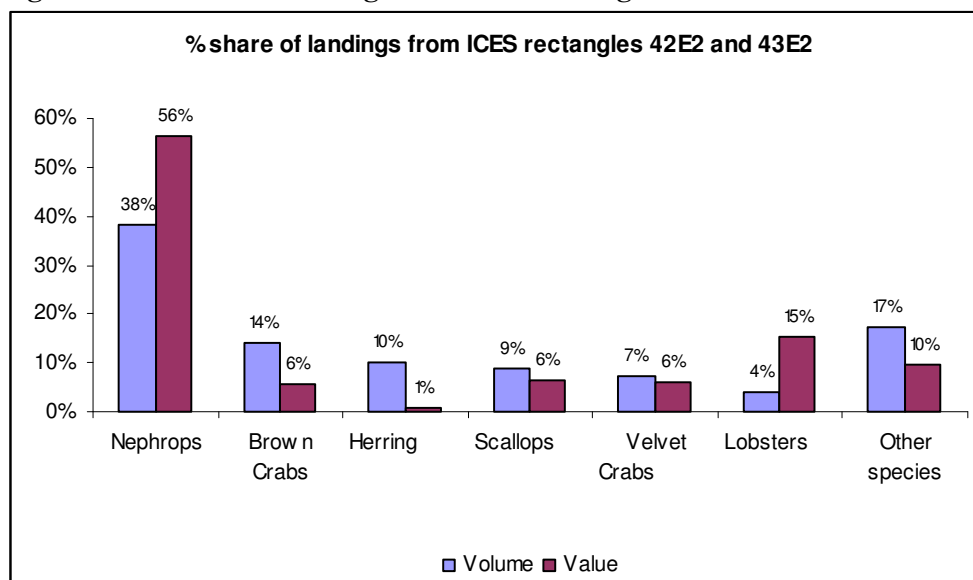
### 3.4.6

Data from Marine Scotland indicates that nephrops was the main species being landed from these two ICES rectangles, accounting for 38% of the volume and 56% of the value of landings between 2006 and 2009. The other main species caught included brown crabs, herring, scallops, velvet crabs and lobsters.

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<sup>6</sup> There were only two pelagic catches in these ICES rectangles during the period 2006 to 2009, worth £37 and £154,628 respectively

Figure 3.3: % share of landings from ICES rectangles 42E2 and 43E2



#### 3.4.7

Information obtained from the local Marine Office indicates that there are 50 active vessels under 10m based locally focusing on mixed creel fisheries in a range of locations around Barra and the surrounding isles. These vessels employ in the region of 75-90 fishermen. The vessels focus their fishing effort within the Sound of Barra, which is relatively sheltered. Fishing farther from shore in the Minch is more weather dependent and more seasonal. There are a further 7 vessels between 10m and 15m which focus on mixed creel fisheries employing around 20 fisherman. These vessels tend to spend a larger amount of time outside the Sound of Barra and target lobsters to the west of the Uists and Barra.

#### 3.4.8

The second most important sector in terms of value from the two ICES rectangles after creel fishing is shellfish trawling, accounting for landings worth an average of £1.85m per annum between 2006 and 2009. Vessels over 15m account for 78% of the value of landings in terms of shellfish trawling, with nephrops accounting for the vast majority of the landings. Information obtained from the local Marine Office indicates that there are 7 vessels based locally over 15m all of which are primarily nephrops trawlers. These vessels are more nomadic and will fish a wider area and spend 2-3 days at sea at a time.

### 3.4.9

Scallop dredging is also an important sector locally. This accounted for an annual average of £324k of landings from the two ICES rectangles between 2006 and 2009. According to the local Marine Office, there are 3 scallop vessels which are based locally. An area east of Eriskay in the Sound of Barra has been identified as an important area for scallop dredging. Hand dived scallops also accounts for a small proportion of landings within the two ICES rectangles. There are thought to be six divers undertaking this activity during scalloping season within the Sound of Barra. It has been indicated that around £500 of scallops can be caught during two days diving within the scallop season.

### 3.4.10

Data from Marine Scotland indicates that the main port at which the catch from these two ICES rectangles has been landed between the years 2006 to 2009 was Mallaig on the Scottish mainland, followed by Barra and then South Uist & Eriskay (Table 3.3). The catch landed at Mallaig related primarily to vessels over 15m, while 80% of the catch by under 10m vessels was landed in Barra, South Uist and Eriskay. Virtually all of the catch landed by vessels under 10m relates to shellfish creels (96%), while this is still the case for over half of vessels between 10m to 15m. The remainder of the catch landed by these vessels between 10m to 15m relates to shellfish trawling (27%) followed by shellfish dredging (12%) and demersal trawling (5%). Shellfish trawling accounted for 43% of the volume of landings by larger vessels over 15m, followed by demersal trawling at 25%.

**Table 3.3: % share of the volume of landings by port in 42E2 and 43E2**

	Under 10m	10m to 15m	Over 15m	All vessels
Mallaig	2%	6%	48%	29%
Barra	41%	26%	15%	23%
South Uist & Eriskay	39%	33%	1%	16%
North Uist & Benbecula	13%	24%	8%	12%
Peterhead	0%	0%	18%	10%
Other ports	5%	11%	10%	9%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Marine Scotland



3.4.11 While Peterhead accounted for 10% of the total volume of landings from the area during this period, this principally related to one particular catch of herring during 2007 by a pelagic trawler. Although this accounted for one tenth of the volume of landings from this area, it only accounted for 1% of the value of landings, given that pelagic species such as herring fetch considerably lower prices when compared to shellfish and demersal species.

3.4.12 Based on the value of the landings in the two ICES rectangles, combined with VMS data and information from the local Marine Office, we have estimated the value of catch which relates to the two dSACs at East Mingulay and the Sound of Barra. VMS data provides data for all vessels over 15m and indicates that around 4% of fishing activity in the relevant ICES rectangles is located within the two dSACs. For the East Mingulay dSAC, the same ratio has been applied for smaller vessels. This suggests that around £86K of fish and shellfish is caught within the SAC boundary. The most important sector is the shellfish trawling and dredging sector, accounting for over half of this figure. (Table 3.4)

**Table 3.4: Estimated value of annual catch in East Mingulay dSAC**

Species category	Under 10m vessels	10m - 15m vessels	Over 15m vessels	Total
Pelagic trawling	£0	£0	£1,546	£1,547
Demersal trawling	£50	£94	£13,205	£13,349
Shellfish trawling and dredging	£843	£2,207	£42,920	£45,970
Creel fishing	£16,521	£7,200	£1,637	£25,357
	<b>£17,413</b>	<b>£9,502</b>	<b>£59,309</b>	<b>£86,224</b>

Source: Marine Scotland and Halcrow

3.4.13 For the Sound of Barra dSAC, further data from the local Marine Office suggests that 50% of the activity of vessels under 10m in the relevant ICES rectangle could be within the Sound of Barra, while the figure is estimated to be 20% for vessels between 10m and 15m. Applying these estimates suggests that £788K of fish and shellfish are caught from within the Sound of Barra dSAC, of which creel fishing is the most important sector amounting to 85% (Table 3.5). Overall, these figures suggest that the two dSACs account for fisheries landings amounting to around £874k.

**Table 3.5: Estimated value of annual catch in the Sound of Barra dSAC**

Species category	Estimated value of annual catch in Sound of Barra dSAC			
	Under 10m vessels	10m - 15m vessels	Over 15m vessels	Total
Pelagic trawling	£0	£0	£0	£0
Demersal trawling	£91	£3,071	£2,444	£5,606
Shellfish trawling and dredging	£6,617	£84,198	£24,356	£115,171
Creel fishing	£476,377	£190,332	£95	£666,804
<b>Total</b>	<b>£483,085</b>	<b>£277,601</b>	<b>£26,895</b>	<b>£787,581</b>

Source: Marine Scotland and Halcrow

#### 3.4.14

In 2009, the landings from the two ICES rectangles accounted for 75% of the value of all landings on Barra and 80% of the landings on South Uist & Eriskay. Virtually all of the catch landed at these ports will be purchased by the five shellfish operators that are based in Barra and the Uists. Data from Marine Scotland indicated that in 2009, the shellfish and fish supplied by fishing vessels to these five operators amounted to over 3,400 tonnes worth over £7.6m. The main species purchased by these operators included brown crabs followed by scallops and nephrops. The estimates outlined above for the value of landings arising from the two dSACs, suggests that the catch arising from these two areas is equivalent to around 11% of the fisheries catch purchased by these five businesses. This is in line with the estimates provided by the shellfish operators consulted as part of the site visits, which ranged from between 10% and 20%.

#### 3.4.15

Shellfish is processed and marketed (both fresh and frozen) for local, national and international markets. The majority of the catch is exported to Spain, Italy and France. This creates further employment in the supply chain by adding value to the product in processing, distribution and marketing. Recent survey data obtained from SeaFish<sup>7</sup> estimates that fish purchases in Scotland account for on average 60% of turnover of shellfish processors. Applying this to the value of fish purchases of £7.6m suggests that the five shellfish operators generated a cumulative turnover of around £12.7m. The same research also indicates that average turnover per employee within the UK shellfish sector is £148,633,

<sup>7</sup> Brown A. (2009) "2008 Survey of the UK Seafood Processing Industry" Seafish Industry Authority

suggesting that this turnover would directly support 85 full time equivalent (FTE) jobs in the processing sector.

3.4.16 In addition to these main species, there has been regular harvesting of cockles on the Traigh Mhor Strand at Barra for many years. Initially by hand-gathering, later by tractor-drawn dredges, the prohibition of the use of tractors for the dredging of cockles and other species, has seen the industry revert to manual conduct. The product is sold locally and exported to the UK mainland.

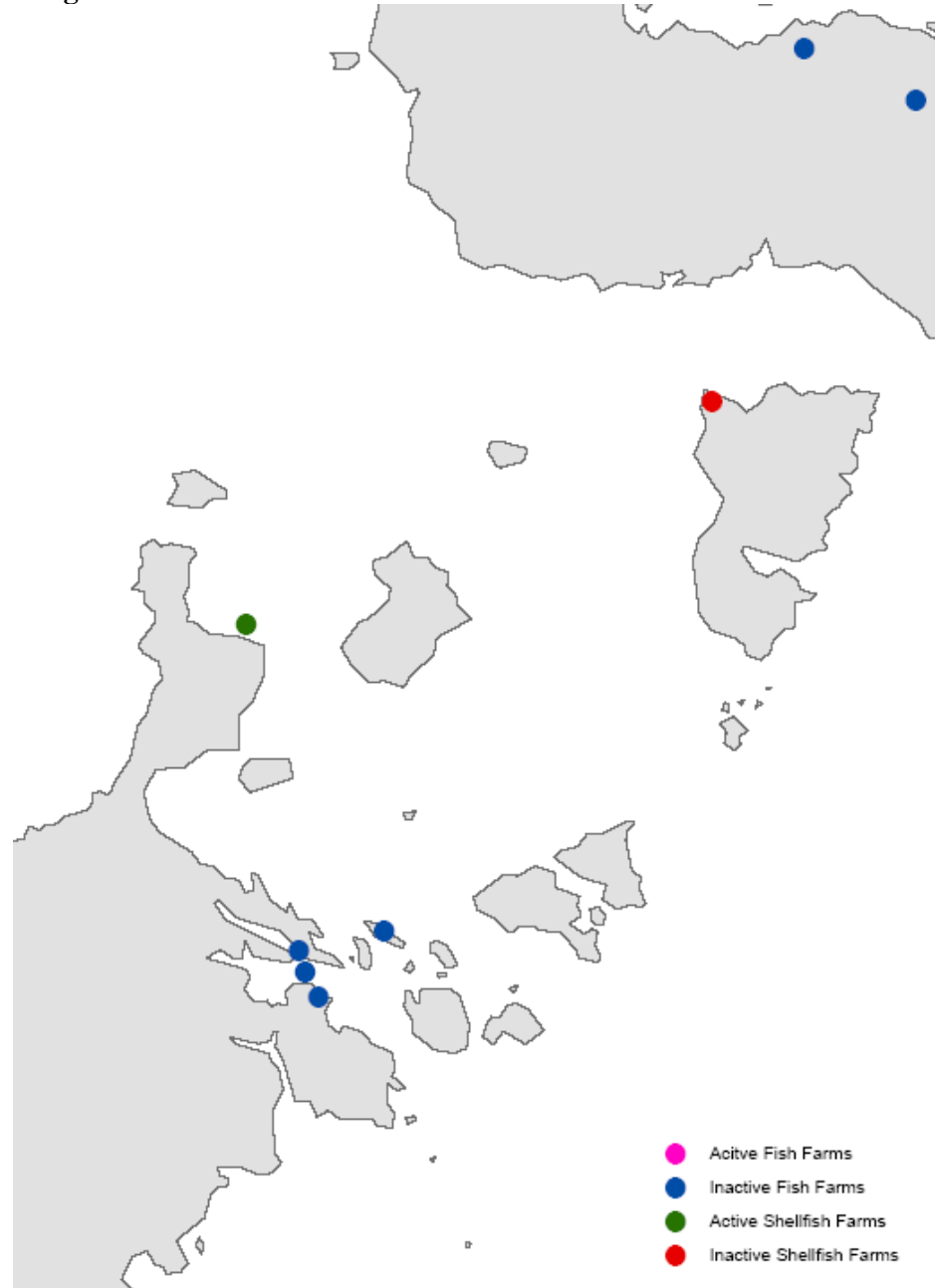
3.4.17 Overall, different fishing activities are likely to be impacted to a varying degree as a result of the designation of the dSACs in the Sound of Barra and East Mingulay. For example, mobile fisheries gear such as dredging and trawling have the potential to have a greater environmental impact when compared to static fisheries gear such as creel fishing.

3.4.18 **In summary, some aspects of current fishing activities could be affected by the designation of the two dSAC due to their potential impact on the integrity of these sites.**

### 3.5 *Aquaculture*

3.5.1 In addition to the shellfish catching and processing sector which has been outlined above, aquaculture is another industry operating in the vicinity. There are a number of sites in the Sound of Barra which have permission to operate (Figure 3.4). Information from Marine Scotland suggests that only one shellfish farm is currently operational, relating to a small scale oyster farm. For reasons of commercial confidentiality no information is provided here on the catch. The contribution of this farm to local employment and income is minimal at the present time (a one man operation) although there is potential for this firm and others to expand operations.

Figure 3.4: Location of fish farms in the Sound of Barra



### 3.5.2

A further four fish farms are currently inactive, which are based on the north coast of Barra. These are focused on farming halibut and salmon. There are also currently trials underway for other oyster farming in the Sound of Barra while there is local interest in developing mussel farming.

- 3.5.3 A review of planning applications for aquaculture development in the Sound of Barra dSAC indicated that the proposal for a mussel farm at Fuiay Rock submitted in February 2006 required greater environmental assessment to be undertaken before proceeding further with the planning application. It appears that this application has not progressed any further. A further application for a salmon farm at the Sound of Hellisay submitted in January 2010 was also likely to require greater environmental assessment which is currently being progressed by the applicant, Marine Harvest. The planning application indicates that this development would be likely to support 6 FTEs with annual average salaries of £22K in the local economy.
- 3.5.4 In addition to this inshore development in the Sound of Barra, Marine Harvest are currently in discussion with Comhairle nan Eilean Siar and the Crown Estate with regard to a £40 million investment in 4 major new salmon farming deep water sites in the Minch. The new system of “Open Sea” farming would envisage crews of up to six living on site on residential barges, each site will be three times the size of a typical existing site and will typically hold up to 5,000 tonnes of salmon (twice the volume currently permitted). At present, these deep water aquaculture developments are still at an early stage of development with further work required from a regulatory perspective to assess the environmental impacts of increasing the size of permissible development from 2,500 to 5,000 tonnes, irrespective of SAC status.
- 3.5.5 Twelve sites are currently being assessed by Marine Harvest, which include Barra, Eriskay and Mingulay, with a shore base also proposed for Barra. The four fish farm sites which will be progressed further will be finalised later this year, with current plans aiming to submit planning applications by the end of 2010, and being operational by 2012. In total, the investment is expected to create 40 full-time jobs. Marine Harvest Scotland has a turnover of £120 million and hopes to increase this to £180 million with the introduction of the new farms. If these plans go ahead and the Barra sites are chosen, this would constitute a significant investment in new jobs and income for Barra, particularly if local residents are employed.
- 3.5.6 In addition to the above, seaweed collection is an activity that has been undertaken for generations with the produce used locally as fertiliser. From discussions with local people it is clear that most is used for domestic consumption with little or no revenue being generated from this activity. There may be some potential to dry and powder seaweed for sale to local industry (as is

the case with the Abhainn Dearg distillery on Lewis), but this is not in the frame at the present time.

3.5.7 The value of seaweed to the Barra economy may best be measured in terms of the cost of substituting it with imported fertiliser. The market cost of calcified seaweed fertiliser, which would need to be imported to the island, amounts to £11/acre/year<sup>8</sup> (excluding the cost of transportation to the islands). If all of the 440 crofts on Barra (each with an average size of 5 acres) were actively managed, this would amount to an increased cost of £24K.

3.5.8 **In summary, any aquaculture development proposed in the Sound of Barra and East Mingulay is likely to be affected by SAC designation due to the potential impact on the integrity of the sites. However, harvesting of seaweed is unlikely to be affected.**

### 3.6 *Tourism*

3.6.1 The most recent assessment of the volume and value of tourism in the Western Isles indicated that the industry generated just under 200,000 visits in 2006, generating direct spending of just under £50m<sup>9</sup>. Over 70% of the market related to leisure tourism (including visitors on holiday and visiting friends and relatives) while around 27% related to business tourism.

3.6.2 The remainder related to visits by visiting yachts. The average spend by visiting yachts was considerably lower when compared to the other tourism markets. Sailing visits to the Outer Hebrides have been increasing over recent years and the islands have the potential to further develop the market by offering challenging sailing conditions in an unspoilt environment. However, the islands remain very peripheral and remote from major marinas and support services. There are currently limited mooring facilities available in Barra and South Uist and the number of yachts visiting the Southern Outer Hebrides remains small.

3.6.3 The most recent audit of accommodation stock in the Western Isles indicated that there were just over 430 tourist accommodation providers across all of the islands. Barra and South Uist account for 100 of these establishments. (Table 3.6).

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<sup>8</sup> Based on the recommended application and indicative cost provided by Celtic Sea Minerals.

<sup>9</sup> Snedden Economics (2007) "Outer Hebrides tourism facts and figures update; review of 2006" A report prepared for HIE Innse Gall, VisitScotland and Comhairle nan Eilean Siar

**Table 3.6: Accommodation Providers: Western Isles**

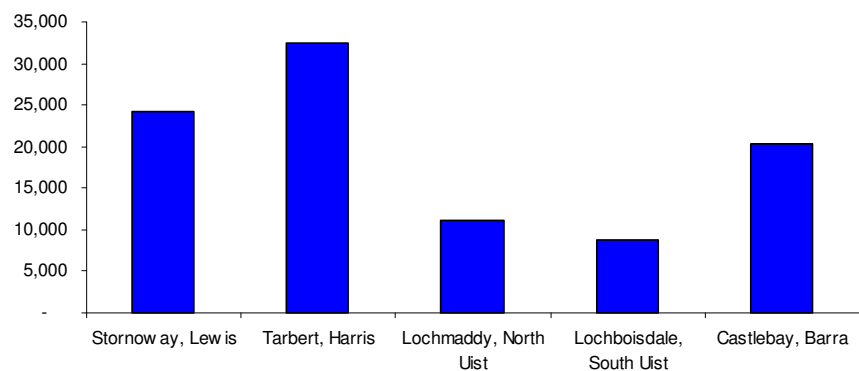
	<b>Hotel</b>	<b>Guest House / B&amp;Bs</b>	<b>Self Catering</b>	<b>Hostel</b>	<b>Camping and caravan</b>	<b>Total</b>
Lewis	9	61	93	4	2	169
Harris	4	20	69	5	0	98
North Uist	5	13	26	2	0	46
Benbecula	2	5	9	1	1	18
South Uist	4	18	26	1	0	49
Barra	4	13	33	1	0	51
<b>Total</b>	<b>28</b>	<b>130</b>	<b>256</b>	<b>14</b>	<b>3</b>	<b>431</b>

Source: Snedden Economics (2007)

#### 3.6.4

There were approximately 100,000 visitors to Visitor Information Centres across the Outer Hebrides in 2009. The largest proportion was to the centre in Tarbert Harris (33%) followed by Stornoway (25%). The centres in Barra and South Uist accounted for around 30,000 visits which was 30% of all the visits across the Western Isles<sup>10</sup>. (Figure 3.5)

**Figure 3.5: Visitors to Visitor Information Centres in the Outer Hebrides, 2009**

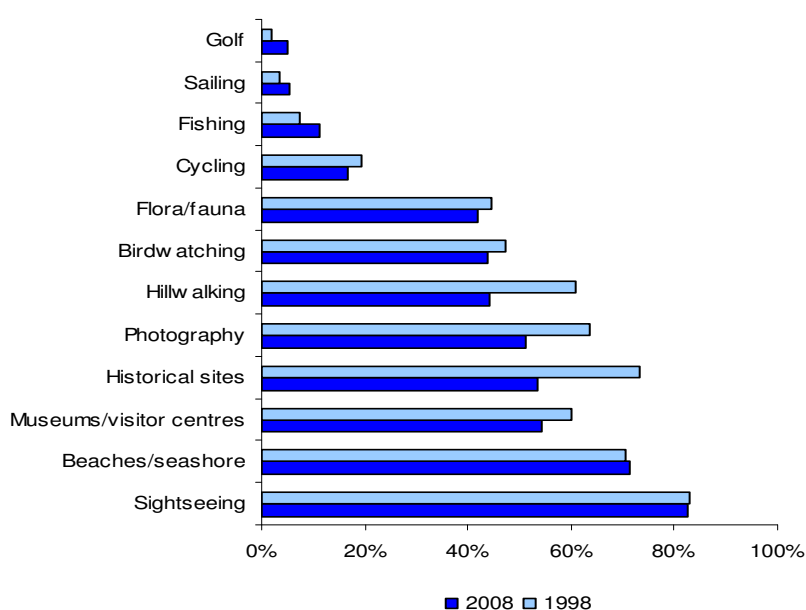


<sup>10</sup> MacPherson Research (2009) "TIC visitor survey 2008" A report prepared for VisitScotland

### 3.6.5

Research which has compared the types of visitor activities undertaken in the Western Isles in 1998 and 2008 suggests that sightseeing and visits to beaches and the seashore have consistently been the most popular activities undertaken in the Western Isles<sup>11</sup>. The research suggests that while the more active water based sporting pursuits (such as sailing and fishing) were undertaken by only a small proportion of respondents to the survey, these activities are growing in popularity. (Figure 3.7)

**Figure 3.7: Visitor activities undertaken in the Western Isles, 1998 and 2008**



### 3.6.6

The Outer Hebrides Area Tourism Partnership plan (OHATP) was published in 2009 and provides an overview of aspirations for the development of the tourism industry in the Western Isles between 2009 and 2015. The plan has been developed by the Outer Hebrides Tourism Industry Association in partnership with VisitScotland, Comhairle nan Eilean Siar, Highlands and Islands Enterprise and Scottish Natural Heritage.

### 3.6.7

The plan emphasises that the main reason people give for visiting the Outer Hebrides is the natural environment. It underlines that wildlife tourism has grown in importance and there are opportunities to extend the tourism season through wildlife tourism. However, recent research tends to support the view

<sup>11</sup> *ibid*



that while the Outer Hebrides has an outstanding asset in its environmental resource as a foundation for nature based tourism, it is not being utilised or promoted as effectively as it could be.

3.6.8

An extensive study of nature based tourism in the Outer Hebrides suggests that outdoor based tourism provision was still at an early stage of development<sup>12</sup>. Factors such as the short season and associated operating costs meant that most operators needed other sources of income, whether tourism related such as accommodation or outside tourism altogether in order to create a viable business. Our analysis also indicates that many people who are employed within the sector also work in other sectors such as fishing and marine harvesting. This highlights the particular nature of the island economy where individuals are more likely to earn income from a portfolio of jobs.

3.6.9

Three tourism businesses have been identified in the Southern Outer Hebrides, all of which were operating from Barra, which specialise in marine based tourism. This includes one company promoting sea kayaking tours in the Outer Hebrides, one business undertaking fishing charters for tourists and another undertaking yacht charter sailing tours around the Southern Hebrides, including the delivery of RYA accredited courses. One further tourism business specialised in promoting beach power kiting for tourists to Barra. In addition, the two principal tourist attractions on Barra both have a strong association with the marine environment. This includes Kismul Castle, which is one of the best examples of Hebridean sea castles in Scotland and Barra Airport, which is the only airport in the world where planes land on a tidal beach runway.

3.6.10

There were mixed views among tourism businesses regarding the extent to which the designation of the two areas would impact on the tourism sector. On the one hand, tourism operators were concerned as to current capacity constraints and the lack of supporting tourism infrastructure. There were also some concerns, particularly among those that were involved in the promotion of sailing-based tourism that there was a risk that there could be greater restriction on access and ability to develop moorings in the vicinity, which could hamper the future development of the sector.

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<sup>12</sup> Taylor, WA., Bryden, DB., Westbrook, S.R. and Anderson, S. (2010). "Nature Based Tourism in the Outer Hebrides". Scottish Natural Heritage Commissioned Report No. 353

- 3.6.11 On the other hand, there were a number of accommodation providers that indicated that the development of the marine Natura 2000 sites would assist in promoting the natural environment within the tourism sector and assist in increasing the profile of the area's pristine environment. There is currently some low level promotion of a number of Natura 2000 sites in the Western Isles including at Loch Maddy and the Lewis Peatlands. There is, however, more active promotion of National Nature Reserves for wildlife tourism by SNH. Some stakeholders indicated a preference for a marine national park to be developed as a means of a more structured promotion of the area as a tourism asset which would include funding for a visitor ranger service. However, there are currently no plans in Scotland for the development of marine national parks.
- 3.6.12 The SNH commissioned study of nature based tourism referred to above states that *"it is critical in understanding the relationship of the visitor to the Outer Hebrides and the environments of the islands to appreciate that the existence of specific designations are largely immaterial to them. The key point is that they are a recognition of the quality and importance that the visitor will attribute to the whole of the island chain."*
- 3.6.13 Overall it is likely that the benefits the dSAC per se would bring to the tourism industry are limited. Nevertheless, better promotion of the Natura 2000 network and increased marketing of the eco-tourism market in the Outer Hebrides would provide the basis for building on the designation as a means of enhancing the scale of the tourism sector and extending the season in to the shoulder months. Overall, future marine based tourism activities which are focused on largely high value, low volume eco-tourism are generally sympathetic to the marine environment could be enhanced as a result of the SAC designation.
- 3.6.14 **In summary, current tourism activities are unlikely to be affected by the designation of the dSAC. Future activities that have been identified appear to be entirely sympathetic to the fragile eco-system of the Sound of Barra and of East Mingulay, and could derive further promotional benefits from being part of the Natura 2000 network.**
- 3.7 ***Shipping***
- 3.7.1 There are a number of ferry routes operated by Caledonian MacBrayne which are situated either within or adjacent to the dSAC. The Sound of Barra ferry travels from Aird Mhor in Barra to Eriskay crosses the Sound of Barra dSAC. The ferry route from Oban to Castlebay and Lochboisdale is located in close proximity to both dSAC (Figure 3.8).





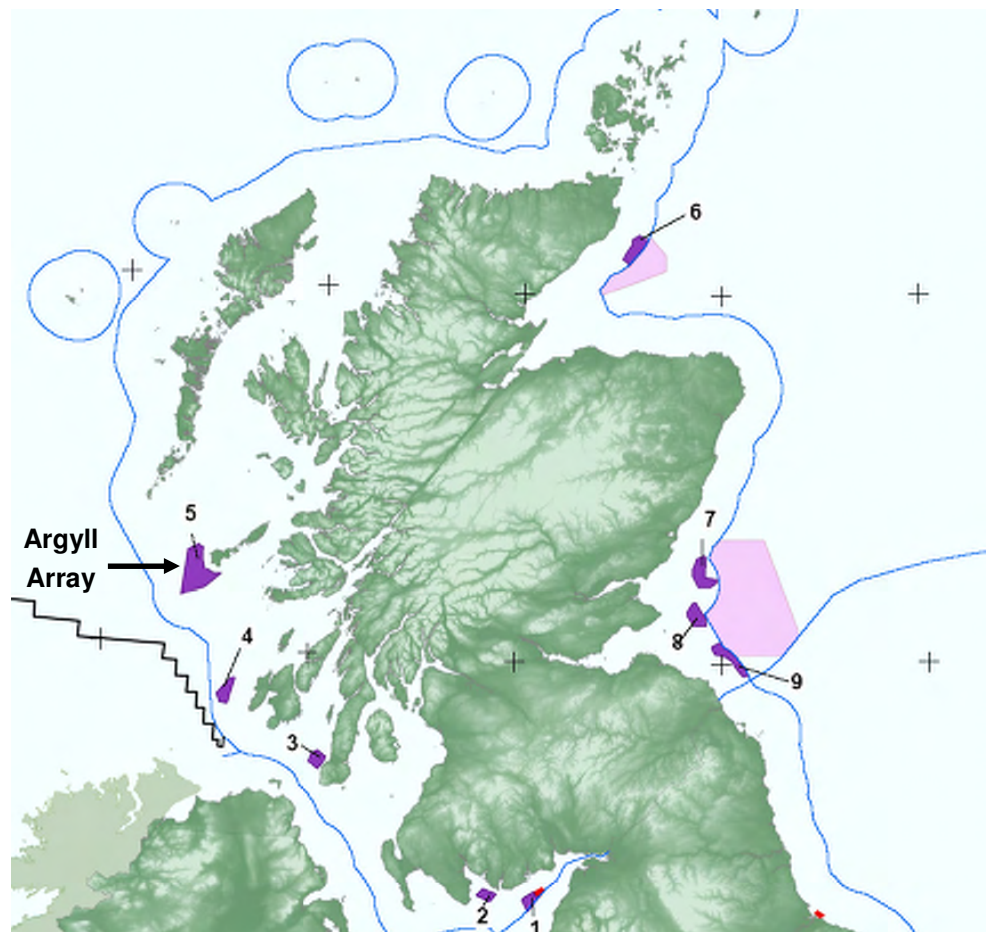
3.8

3.8.1

***Offshore Renewables:***

At present there are no proposed offshore renewable developments planned or proposed in the vicinity of the two dSAC. The nearest commercial scale offshore wind site currently proposed is the Argyll Array, which is situated to the south of the Outer Hebrides, adjacent to the Isle of Tiree (Figure 3.10)

**Figure 3.10. Current Offshore Wind Activity being developed in Scotland**



Source: Crown Estate

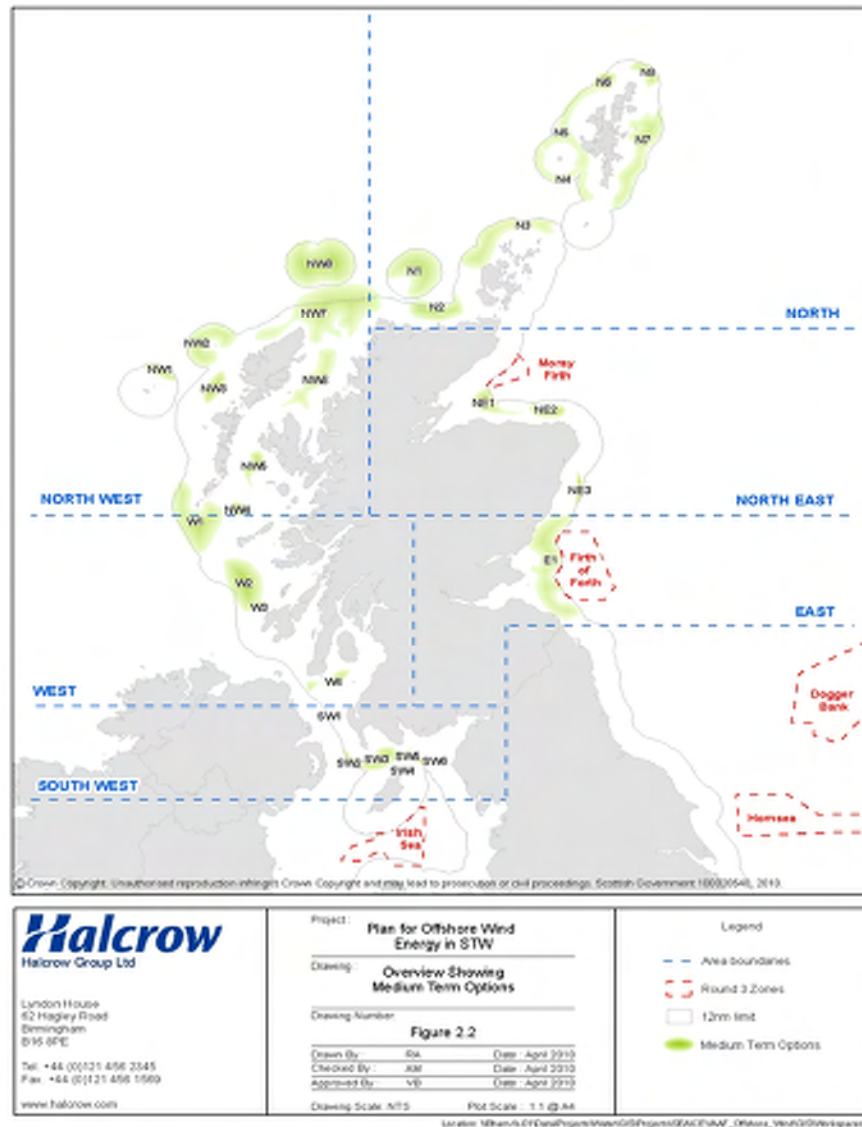
3.8.2

More recent work commissioned by the Scottish Government as part of the Draft Plan for Offshore Wind Energy in Scottish Territorial Waters has suggested a further 30 sites for consideration for future development in the period 2020-2030 (Figure 3.11). These include a number of sites situated around the Outer Hebrides, with one proposed site W1, partially covering the East



Mingulay dSAC. The proposed site NW4, is situated to the West of the East Mingulay dSAC.

**Figure 3.11: Medium term offshore wind sites in Scottish Territorial Waters**

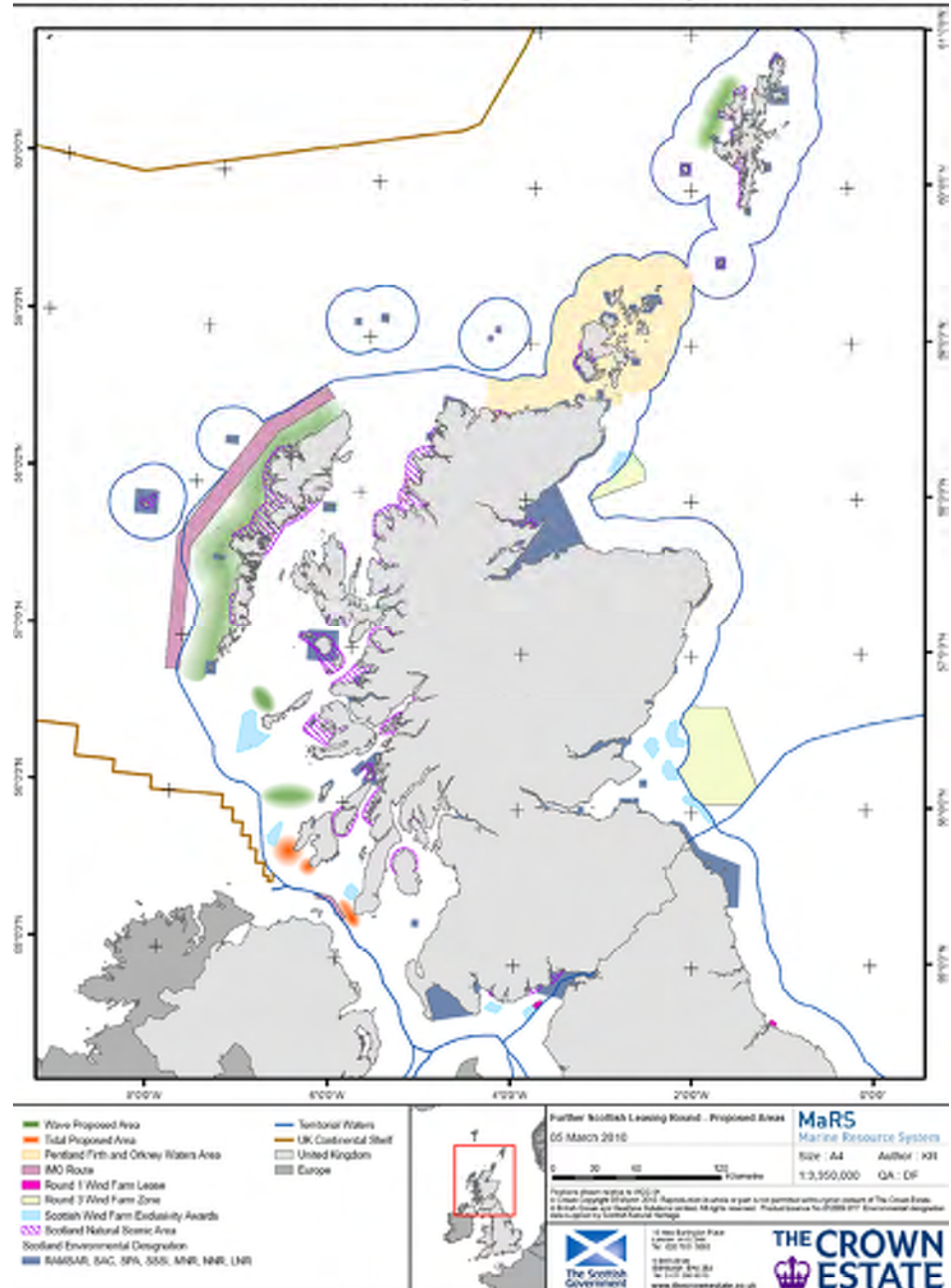


### 3.8.3

In terms of wave and tidal stream technologies, the initial focus has been on developing sites in and around the Pentland Firth, off the north coast of the Scottish mainland. More recent work issued by the Crown Estate provides an indication of proposed areas for future leasing grounds. The full length of the western Atlantic coast of the Outer Hebrides is proposed as a potential area for

future wave energy development (Figure 3.12). This area is to the West of the dSAC in the Sound of Barra.

**Figure 3.12: Further Scottish Leasing Round Areas for Wave and Tidal**  
**Further Scottish Leasing Round - Proposed Areas**



- 3.8.4 Environmental implications of marine renewable infrastructure may include some or all of the following issues:
- Removal of seabed and associated habitats and species
  - Potential impacts to sensitive marine receptors such as mammals (dolphins, whales, seals, otters) and other organisms
- 3.8.5 The precise nature of short and long term impacts of noise and vibration on some of these receptors is poorly understood at present and would need to be factored in all applications using a precautionary approach as well ensuring adequate research into the topic.
- 3.8.6 **In summary, while there are currently no proposed offshore renewable developments planned or proposed in the vicinity of the two dSAC, any proposals for future marine renewable development in or adjacent to the Sound of Barra and East Mingulay could require HRA but this is already likely to be required to satisfy protection requirements of existing Natura sites.**
- 3.9 ***Offshore Cables:***
- 3.9.1 Telecommunications and some electricity cabling infrastructure currently pass through the Sound of Barra. In addition, there is speculation that cables associated with renewable energy providers in other islands of the Outer Hebrides could be routed via the Sound. There is no knowledge of cables in the vicinity of the East Mingulay site. The UK Cable Protection Committee has indicated that the industry is eager to support marine conservation initiatives where possible. As cables are usually laid on soft sediment rather than habitats such as cold water reef (or other uneven surface) where they could get easily tangled, it is assumed that offshore cable issues might only affect the Sound of Barra SAC.
- 3.9.2 **In summary, while there are currently no proposals to develop offshore cables in the vicinity of the two dSAC, any proposals for future development of offshore cables in the Sound of Barra could be affected by the designation of the site.**



3.10

***Aggregate Extraction:***

3.10.1

There are no marine aggregate licence areas or applications for licences within or adjacent to the two dSACs.

3.10.2

**In summary, there are unlikely to be any future proposals for aggregate extraction in the vicinity of the Sound of Barra and East Mingulay and so this activity is unlikely to be affected by the designation of the two sites.**

3.11

***Summary***

3.11.1

The Sound of Barra and East Mingulay's highly productive and largely unchanged environments play a key role in many of the Barra people's lives. The economy of the Southern Outer Hebrides is fragile and relatively dependent on the fishing sector for employment and income. The uniqueness of island life means that many households undertake a plurality of occupations to supplement seasonal and/or low paid formal sector work in, for example, fish processing. In-shore fisheries also contribute to the subsistence livelihoods of the crofting community on Barra.

3.11.2

The analysis of economic activities underlines that current fishing activities could be affected by the designation of the two sites at East Mingulay and in the Sound of Barra. The main activities which are most likely to be restricted are mobile gear fishing activities relating to dredging and trawling within both of these sites. Scallop dredging is focused in an area to the East of Eriskay within the Sound of Barra, while nephrops trawling is undertaken around the reefs at East Mingulay. Fishing activities using static gear such as creel boats are less likely to be affected by the designation in the Sound of Barra and are likely to be able to continue as at present. In addition, proposals for future aquaculture development in the Sound of Barra could be affected by the requirement for more extensive environmental assessment and the development of mitigation measures as a result of SAC designation.

## 4 Approach to analysis of costs and benefits

- 4.1.1 The economic implications of introducing or increasing the level of marine protection through the designation of SACs in the Sound of Barra and East Mingulay is important for at least two reasons. First, to ensure that policy decisions are undertaken with full regard to the wider welfare impacts arising from designation. Secondly, the process provides a means of assessing the wider sustainability of the protection measures, in relation to affordability and where the costs and benefits fall.
- 4.1.2 The cost-benefit analysis (CBA) undertaken as part of this Impact Assessment has been applied over a specific timeframe. The approach recommended by JNCC indicates that an appropriate timescale over which to undertake the analysis is ten years.
- 4.1.3 A major difficulty with undertaking this type of analysis, is valuing the benefits arising from designation. The benefits highlighted in this study are difficult to quantify, and many are rather subjective and long term. Inter-dependent services and values, multiple stakeholders with different perspectives, imperfect scientific understanding and uncertainty about the future consequences of proposed activities/actions, both in timescale and impact, all contribute to making such valuation difficult. For example, while it has been relatively straightforward to estimate the economic value of fish as part of this analysis, it has not been possible to undertake this analysis for other goods or services with no clear or measurable market value, such as the conservation of genetic resources.
- 4.1.4 The distribution of costs and benefits among the local population in Barra and South Uist can have a particularly important effect upon sustainability, and this has been accounted for as part of this analysis. In this case, the local communities could potentially bear significant costs for marine protection, for example through restrictions on productive activities. However, it is likely that they will receive disproportionately fewer benefits, as these will be spread more widely and over a longer timeframe.

#### 4.1.5

A list of the individual goods and services that are believed to be dependent on or associated with marine biodiversity was defined at a workshop organised by the European Network of Excellence Marine Biodiversity and Ecosystem Function (MarBEF). Here, ecosystem services were defined as “the benefits which people obtain from ecosystems”, and are divided into four broad categories:

- provisioning/production services,
- regulating/supporting services,
- cultural services,
- option use values

#### 4.1.6

These are summarised in table 4.1 and discussed in more detail below.

**Table 4.1: Marine ecosystem goods and services**

Categories	Goods and services	Examples
<b>Provisioning/Production services</b> (benefits valued in terms of actual use, i.e. having <i>direct consumptive use value</i> )	Food, water, natural materials, genetic resources	Food provision (e.g. finfish, shellfish), raw materials provision (e.g. sand and gravel), scientific/medical resources
<b>Cultural services</b> (benefits with mixed <i>non-consumptive direct use</i> and <i>non-use value</i> )	Associated with aesthetic, spiritual and educational value	Leisure and recreation, cultural heritage and identity, cognitive development, existence value
<b>Regulating/Supporting services</b> (benefits with various <i>indirect use value</i> )	Regulation of climate, flooding and water quality, nutrient cycling, primary productivity	Disturbance prevention, gas and climate regulation, bio-remediation of waste, resilience and resistance, biologically mediated habitat, nutrient cycling
<b>Option use values</b> (providing ‘guaranteed’ option of future use or quasi-option of avoiding loss in case there may be future benefit)	Currently unknown potential future uses of marine biodiversity	Unknown future uses, speculative benefits

Source: Adapted from Beaumont, N, and Austen, M (2006), Goods and services provided by marine biodiversity, in: (2006) *Marine Biodiversity and Ecosystem Functioning EU Network of Excellence: General Assembly – Science Meeting Lecce (Italy) 9-11 May 2006: Book of Abstracts*, 10 pp.

- 4.1.7 The above list is considered comprehensive in that it covers most, if not all, broad categories of marine biodiversity-related goods and services, including non-use benefits, such as those expressed in terms of their option and existence values. Each of the categories listed in Table 4.1 is briefly considered below.
- 4.2 ***Production and Provisioning services***
- 4.2.1 We have viewed this category as the key aspect of the cost benefit analysis in terms of primary data collection in the study area, particularly in relation to assessing current fishing practices in the vicinity of the dSACs. The nature, scale and management of current fishing activities have been explored and the potential consequences under different future scenarios have been assessed. For example, different fishing activities are likely to have different implications, with some practices such as dredging for particular species such as scallops having greater impact compared to other fishing activities. These are set out in more detail in chapter five.
- 4.3 ***Cultural services***
- 4.3.1 The main aspect of cultural services which has been assessed as part of this analysis relates to use values such as leisure and tourism activities. Many leisure and recreation activities associated with marine conservation in the Western Isles are largely dependent on marine biodiversity, particularly activities such as bird watching, rock-pooling, scuba-diving, angling and marine wildlife watching (whale, dolphin, seal and seabirds). Extensive consultation was undertaken with tourism operators both within the accommodation sector as well as eco-tourism operators, which has been integrated into the analysis presented in this report.
- 4.4 ***Regulating and supporting services***
- 4.4.1 These services relate to the natural functions of the marine environment. However, these services are very difficult to value and it has not been possible to assess the value of these services in relation to the two dSACs
- 4.5 ***Option values***
- 4.5.1 Option values are very difficult to assess as future needs and values are by their very nature difficult to predict. As a result, it has not been possible to assess these as part of this analysis. Nevertheless, it is widely accepted that the genetic resources available in the marine environment could in the future be important for improved and more varied food provision and pharmaceutical products.

This could be a particularly important issue for the conservation of the East Mingulay reefs.

#### 4.5.2

In summary, the key focus of the cost benefit analysis in terms of quantification and monetisation has been on the production and provisioning values, principally direct use, which have a bearing on the commercial use of the study area and potential impacts within the economy. This will also be a key issue in terms of future management plans for the area and the implications arising from different options for designation. In addition, the analysis has underlined the importance of assessing the impact on cultural services, in terms of maximising the benefits locally in terms of recreation and tourism, as well as providing educational and scientific benefits. These issues have been explored as part of the study to assess the potential future impacts arising from different options and inform how best the sites can be managed in the future.

## 5 Assessing the costs and benefits of options

### 5.1

#### 5.1.1

#### ***Background***

This chapter presents a qualitative and quantitative assessment of the potential costs and benefits of the various policy options. Impacts have been assessed over a timescale of ten years. The decision to use this timeframe was based on two factors.

- (a) It is the same method that has been adopted by JNCC to develop impact assessments for a suite of Natura 2000 sites planned for consultation in 2010;
- (b) It provides a sufficiently long period over which conservation benefits may arise and fisheries control measures may be implemented.

#### 5.1.2

This section sets out the policy options for the dSAC impact assessment and examines the potential costs and benefits associated with each. Three options are considered for the two new designations being considered:

- Option 1: No designation of the sites (Do nothing)
- Option 2: Designation of both sites with no change to level and intensity of current activities and possible restrictions to future activities
- Option 3: Designation of both sites with potential changes to current activities and possible restrictions to future activities

#### 5.1.3

The costs and benefits are subject to significant uncertainty. The main causes for the uncertainty are:

- There is as yet no firm decision on what the management measures might be for the two sites.
- It is difficult to predict the reaction of local entrepreneurs and businessmen to changes in the proposed management associated with the two designated sites
- It is difficult to monetise the value of environmental changes to the marine environment

- 5.1.4                      Apropos this, a number of scenarios have been developed by Halcrow in conjunction with the Scottish Government that attempt to estimate the impact of the minimum and maximum management measures that could be implemented at each site to achieve the conservation objectives of the dSAC. The costs and benefits of each are then calculated. The overall approach to assessing potential costs and benefits is based on the approach adopted by JNCC, which has been set out in chapter one.
- 5.2                        ***Implications of designation***
- 5.2.1                      The decision to designate the sites will be solely based on scientific evidence to meet the UK's obligations under the Habitats Directive. However, the costs and benefits of designating the areas and the potential management measures used to achieve their conservation objectives should be understood. Once sites have been submitted to the EU for designation, in order to achieve the site's Conservation Objectives, Competent Authorities are required to assess the implications of any activity likely to have a significant effect. This relates to activities that they consent to and to review existing consents or permissions. This stage has not yet been reached.
- 5.2.2                      It is therefore necessary to make assumptions based on existing SACs in Scotland to identify what measures might be required for these sites. A total of 25 of the existing marine SAC in Scotland have been designated in relation to the qualifying features relevant for the Sound of Barra and East Mingulay (Table 5.1). The map IDs highlighted for each of these SACs relate to the map of marine designations in Scotland, illustrated at figure 1.1.
- 5.2.3                      There are two sites, Dornoch Firth & Morrish More and Sanday which have been designated in relation to all three of these qualifying features, as is the case for the Sound of Barra. Statutory advice has been provided by SNH in relation to each of the current SACs in relation to human activities, either on or affecting the SAC, which may cause deterioration of the marine natural habitats or the habitats of species, or disturbance of species outlined in the table above. This advice needs to be considered by relevant authorities in fulfilment of the requirements under Regulation 33(2)(b) of The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

**Table 5.1: Current marine SACs in Scotland with similar qualifying features**

<b>Map ID</b>	<b>Site name</b>	<b>Harbour Seals</b>	<b>Reefs</b>	<b>Subtidal Sandbanks</b>
55	Ascrib, Isay and Dunvegan	Yes		
56	Berwickshire and North Northumberland Coast		Yes	
57	Dornoch Firth and Morrich More	Yes	Yes	Yes
58	Eileanan agus Sgeiran Lios mór	Yes		
60	Firth of Lorn		Yes	
61	Firth of Tay & Eden Estuary	Yes		Yes
62	Isle of May		Yes	
63	Loch Creran		Yes	
64	Loch Laxford		Yes	
65	Loch nam Madadh		Yes	Yes
68	Lochs Duich, Long and Alsh Reefs		Yes	
69	Luce Bay and Sands		Yes	Yes
72	Moray Firth			Yes
73	Mousa	Yes	Yes	
74	North Rona		Yes	
77	Papa Stour		Yes	
78	Sanday	Yes	Yes	Yes
79	Solway Firth		Yes	Yes
80	Sound of Arisaig (Loch Ailort to Loch Ceann Traigh)			Yes
81	South-East Islay Skerries	Yes		
83	St Kilda		Yes	
84	Sullom Voe		Yes	
85	Sunart		Yes	
87	Treshnish Isles		Yes	
88	Yell Sound Coast	Yes		



5.2.4 The advice provided by SNH in relation to the Dornoch Firth and Morrich More SAC has been used to reflect the potential activities which could be affected as a result of the management regime introduced as a result of the SAC designation<sup>13</sup>. The type of activities which could be affected in some way include

- Aquaculture (fish and shellfish farming)
- Coastal development (agriculture, civil engineering and forestry operations)
- Discharges of commercial effluent and sewage
- Fishing (Dredging, trawling and netting)
- Gathering and harvesting (Bait gathering as well as diver and intertidal collection of shellfish)
- Commercial marine vessel traffic
- Military Activity such as military exercises
- Recreational activities: (boat anchorages, boat mooring, charter/recreational vessels and other recreational activities)
- Scientific Research

5.2.5 Further details relating to the nature of the potential impacts in relation to these various activities is contained in appendix D. While some of the potential impacts arising may result in restrictions to some of these activities, the scale and intensity of many of these activities will not be affected and are likely to only require better management and mitigation measures to be formally established.

5.2.6 In order to be able to assess the costs and benefits that could arise from curtailment of any of these activities, scenarios have been developed to identify the minimum and maximum management changes that might be required at the site. Table 5.2 outlines the scenarios developed for the two designated sites and the potential impact on existing activities and future plans and projects. Further discussion in relation to each of the options is presented later in this chapter. Information is also set out in relation to the quantifiable and monetised costs and benefits are likely to arise from the designation of the dSAC.

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<sup>13</sup> SNH (2006) “Dornoch Firth and Mirrich More Special Area of Conservation – Advice under Regulation 33(2)

Table 5.2 Summary of the Management Scenarios for the dSAC

Option 1: No designation	Option 2: Management of new activities	Option 3: Management of existing and future activities
<p><u>Existing activities</u> No change to current management.</p>	<p><u>Existing activities</u> No change to current management of existing activities as they are compatible with maintenance of SAC habitats and species.</p>	<p><u>Existing activities</u> Changes to the current management of existing activities is required to address impacts on both SACs.</p> <p><i>Fishing</i> The most likely scenario would be restrictions arising in relation to scallop dredging in the Sound of Barra dSAC, which could be curtailed, due to the impact of the activity on the subtidal sandbank habitats.</p> <p>If there was evidence that other fishing activities were impacting on the integrity of each of the sites, the most restrictive scenario for both dSACs could involve closure to all current fishing activities.</p>
<p><u>New plans or projects</u> Development plans are consented but this may result in increased environmental costs.</p>	<p><u>New plans or projects</u> Under stricter regulatory regime which will require future development affecting the SACs to be considered under the Habitats Regulations (HRA).</p> <p>The key issues arising as a result will include::</p> <ul style="list-style-type: none"> <li>➤ Stricter environmental assessment requirements and businesses more aware of environmental impact.</li> <li>➤ Businesses may face delays to consents and increased cost arising from the requirement for greater environmental assessment.</li> <li>➤ There is a risk that more projects fail to pass the environmental assessment required by HRA resulting in more development opportunities requiring mitigation measures, alternative solutions or possibly being curtailed.</li> </ul> <p>These issues have the same relevance for the Sound of Barra as they do for Mingulay, although it is expected that fewer plans or projects requiring HRA are likely to come forward in relation to Mingulay than for the Sound of Barra.</p>	

### 5.3

#### ***Option One: No Designation (Do Nothing)***

#### 5.3.1

This option assesses what is likely to happen over the assessment period if the sites are not designated and no management measures are put in place. This constitutes the baseline against which the costs and benefits of options 2 and 3 have been compared. It also assesses the vulnerability of the site features at the Sound of Barra and East Mingulay as determined by their sensitivity to impacts and the potential exposure to those impacts under a ‘do nothing’ scenario.

#### 5.3.2

Under this option all present activities would continue unabated. There would be no change to income or employment in the local economy that could be attributed to the dSAC. In the absence of designation and with no curtailment of current fishing activities, particularly those relating to trawling and dredging in the Sound of Barra and off the East Mingulay reef, there would be a risk of deterioration, and therefore a risk of not achieving the aims of the Habitats Directive to maintain or restore Annex I habitats and Annex II species.

#### 5.3.3

In terms of current management practices, the existing seasonal prohibition on the use of mobile gear in part of the Sound of Barra would remain in place. This measure is contained in the Inshore Fisheries (Prohibition of Fishing and Fishing Measures) (Scotland) Order 2004. While the prohibition lasts for the period between the beginning of March and end of October, scallop dredging has been exempted from the full exemption and can take place between the beginning of May and the middle of August.

#### 5.3.4

In terms of cost to government under a do nothing scenario, the option to not designate the sites has the potential to lead to infraction from the EU and likely legal challenge from non-governmental organisations. The costs of this involve the potential legal costs of dealing with the situation and potentially a fine from the EU as a result of infraction. Evidence from other cases in the EU indicate that infringements can result in a multi-million pound fine imposed on the Member State.

5.4 *Option Two: Designation of both sites with no change to level and intensity of current activities and possible restrictions to future activities*

Management of Existing Activities

5.4.1 Under this management scenario, it is assumed that an evidence base exists to show no adverse effect on site integrity in relation to the sandbanks, reefs or Harbour Seals in the Sound of Barra and on the reefs at East Mingulay in relation to existing activities, particularly fisheries activities in these areas. This means that no additional measures would be necessary to control existing fishing activities. As is the case with the do nothing option, the existing seasonal prohibition on the use of mobile gear in part of the Sound of Barra would remain in place.

Management of New Plans or Projects.

5.4.2 The designation of the two dSACs would mean that future developments in or adjacent to the SAC sites could only be authorised if it could be ascertained that there would be no adverse effect on the integrity of the site. This process is known as the Habitats Regulations Appraisal (HRA). If this cannot be ascertained beyond reasonable scientific doubt, the development proposal could only go ahead if there were no imperative reasons of over-riding public interest to proceed.

5.4.3 The key issues arising as a result will include:

- Stricter environmental assessment requirements and businesses more aware of environmental impact.
- Businesses may face delays to consents and increased cost arising from the requirement for greater environmental assessment.
- There is a likelihood that more projects fail to pass the environmental assessment required as part of the HRA resulting in more development opportunities requiring mitigation strategies developed
- For development opportunities where developing sufficient mitigation measures are either not feasible or uneconomic, these are more likely to be curtailed.

5.4.4 Additional implications that will affect new plans or projects are likely to be associated with the following sectors: proposed and potential future marine harvesting, marine renewable energy and improved transport links. All three broadly apply to Sound of Barra only with the possible exception of associated

infrastructure for renewable energy which may involve the draft SAC at East Mingulay.

5.4.5

As mentioned previously, there are currently several marine harvesting proposals being discussed for the Sound of Barra including some large scale salmon farms, mussel and oyster facilities (new as well as enlargement of existing ones). Typically, environmental implications of marine harvesting include the following factors:

- Deterioration, disturbance and/or removal of seabed and associated habitats and species
- Introduction of alien species/disease/sea lice/genetic variation
- Discharge of a range of effluents from the facilities (largely confined to fish farms rather than oyster beds and/or mussels grown on ropes)
- The need to feed carnivorous species like salmon high quality fish meal, the sourcing of which can place additional strain on already depleted fisheries resources locally, regionally and globally.

5.4.6

A review of proposed development plans in the Sound indicated that further environmental assessment was required for applications for the salmon and mussel farms, while this was not required for the proposal for oyster farming. In terms of the proposal for mussel farming, feedback from local stakeholders indicated that the additional environmental assessment which was required for this development to proceed (including a video survey, benthos surveys and potentially a hydrographic survey) was felt to be too onerous for the local business that was proposing to develop the project.

5.4.7

The proposal for the salmon farm, which is being pursued by Marine Harvest, a large multi-national aquaculture business is being progressed with further environmental assessment requirements being undertaken. This development is likely to require both an Environmental Impact Assessment as well as an Appropriate Assessment. This underlines that larger businesses are more likely to be able to afford the higher environmental assessment costs which are likely to accrue as a result of SAC designation.

5.4.8

Future civil engineering projects in the Sound of Barra such as the proposed harbour development at Ardveenish would also be affected by the requirement for greater environmental assessment, which would also be required because of the original SAC proposal. This project is located within the Sound of Barra

dSAC and includes proposals for 145m of new berthing adjacent to the existing pier. The proposal will provide overnight berthing for local and visiting vessels. The development is likely to require greater environmental assessment and mitigation measures to be put in place, particularly during the construction phase.

5.4.9

In addition, longer term plans for the construction of a hard landing strip at the existing airport at Traigh Mhor would be more difficult to proceed given the potential impact of this proposal on the integrity of the Sound of Barra dSAC. While detailed feasibility work has been undertaken in relation to the construction of a hard landing strip at Traigh Mhor, the plans have not progressed any further as the Twin Otter plane which is used for the operation of the subsidised air service on the beach at Traigh Mhor, is now back in production.

5.5

***Option 3: Designation of both sites with potential changes to current activities and possible restrictions to future activities***

5.5.1

This option would, most likely lead to greater restrictions being placed on both current and future activities with respect to the use of the marine environment and in order to achieve the site's Conservation Objectives. The Competent Authorities will assess the impacts on the habitat and/or species and, in light of this, review existing consents or permissions. Option 3a explores the impact of curtailment of dredging and trawling activity within the two dSACs, while Option 3b explores the implications of a complete closure of these two sites to all forms of fishing.

Management of Existing Plans or Projects

5.5.2

Under this management scenario, it is assumed that there is evidence to suggest that the sandbanks, reefs and/or Harbour Seals in the Sound of Barra and/or reefs at East Mingulay have been impacted by existing activities. This means that additional measures would be required to manage and potentially restrict existing activities, which is of particular relevance to the current level of fishing within the two dSACs.

5.5.3

The estimates of fishing activity undertaken in the two dSACs is presented below (Table 5.3). Overall, creel fishing accounts for the largest proportion of fishing activity, amounting to nearly 80% of the value of landings from these two areas.

**Table 5.3: Estimate of the value of fishing activity in the dSACs**

Species category	East Mingulay dSAC	Sound of Barra dSAC	Both dSACs
Pelagic trawling	£1,547	£0	£1,547
Demersal trawling	£13,349	£5,606	£18,956
Shellfish trawling and dredging	£45,970	£115,171	£161,141
Creel fishing	£25,357	£666,804	£692,161
<b>Total</b>	<b>£86,224</b>	<b>£787,581</b>	<b>£873,805</b>

Source: Marine Scotland and Halcrow

5.5.4

In reviewing the statutory advice provided by SNH in relation to other existing marine SACs, it is possible that existing activity in relation to trawling and dredging could be curtailed within the two dSAC. This would have a particular impact on dredging for scallops in the Sound of Barra and trawling for nephrops off the East Mingulay reefs. **Overall, Option 3a, which would result in closure to these mobile catching gear, would result in the loss of landings worth over £181K from the proposed SACs.**

5.5.5

Given that the trawling and dredging activity is generally undertaken by larger vessels which are less focused on these two particular areas but are more nomadic, we would expect that some of this fishing activity to be displaced to other areas. This would particularly be the case of both pelagic and demersal trawling. However, in the case of scallop dredging, which is focused within the Sound of Barra, we would expect that a large proportion of this activity would not move elsewhere as there is a focus on a particular area adjacent to Eriskay. A proportion of these vessels are under 15m and are less suitable to venture further from the sheltered Sound to other fishing grounds all year round.

5.5.6

In contrast to potential restrictions on mobile gear, it is highly unlikely that creel fishing activities would be curtailed as a result of the SAC designation. However, if this was the case for any reasons, this would have a major detrimental impact in the local economy. **The option 3b scenario, which explores the impact of a complete closure of both sites to all forms of fishing estimates that this could result in an annual loss in fisheries landings of over £870k from the proposed SACs.** This sector is dominated by smaller vessels which fish close to shore and so would be unlikely to be able

to displace all their activity from the Sound of Barra to other potential fishing grounds.

5.5.7

Overall, the main risks of unintended consequences which could arise as a result of the decision to designate the two dSACs relate to the displacement of fishing effort to alternative grounds. This could intensify fishing at those grounds to unsustainable levels, causing damage to fish stocks overall. In addition, it could also result in an increase in conflict between mobile and static fishing gear. A further consequence of this displacement would be a possible increase in travel time and fuel costs for fishing vessels required to travel to fishing grounds farther afield. These risks are relevant for option three which would result in the curtailment of existing fishing activities. Option 3b, which would result in the closure of both dSACs to all fishing would have the greatest and most detrimental negative consequences in this regard.

5.6

***Benefits of designating the site***

5.6.1

The benefits of designating the two dSAC relate mainly to the management of the sites and the beneficial impact this will have on the features (sandbank, harbour seals and reefs) it is designed to protect. The benefits of a greater degree of management of the sites could also improve the sustainability of various fisheries stocks and the health of the environment around Barra. These controls could lead to more sustainable management of the resources to the extent that fish stocks could increase in future.

5.6.2

While the SNH reports on the Sound of Barra and East Mingulay have concluded that there is little evidence to suggest that current human activity is having a detrimental effect, it is clear that if anthropogenic damage was caused, the effects would be permanent with limited capacity for the habitats to recover. The report on East Mingulay states “*Although ground truthing is limited, the structure and function of the surveyed reef to the east of Mingulay appears to be well conserved. There is some evidence of deepwater trawling through gear debris and possible trawls marks but there remain dense areas of live and dead reef framework. It is unlikely that fisherman would intentionally trawl over the reef areas due to the damage it would cause to their gear. If it did occur, trawling would have a severe impact on these fragile reefs, with limited scope for recovery*”

5.6.3

In terms of the Sound of Barra, the SNH report states that “*Fishing activities that cause physical disturbance of the benthos, such as scallop dredging and or/ hydraulic dredging, are a particular risk for the extensive maerl beds and Zostera beds within this area, which if destroyed are virtually impossible to restore*”. There has also been an apparent but



unexplained drop in the numbers of seals in the Sound of Barra. Further data is being gathered from the Sound using drop-down videos, which may yield more information in future.

5.6.4 Overall, given the above and the current limited understanding of if and how designation might limit activities currently being undertaken at the two sites, environmental benefits are difficult to identify.

5.6.5 Furthermore, even though official data from Marine Scotland suggests that stocks of species such as nephrops, lobsters and crabs are being exploited unsustainably in Scotland (Fish and Shellfish Stocks 2010, Marine Scotland Science), imposing closures, effort reductions etc may not necessarily benefit stocks overall as fishing fleet and fishermen may operate elsewhere. By the same token, it is argued that temporary closures and the designation of no go zones for fisheries may benefit local and regional stocks.

5.6.6 While the direct tourism benefits arising from designation are likely to be limited, better promotion of the Natura 2000 network and increased marketing of the eco-tourism market in the Outer Hebrides would provide the basis for building on the designation as a means of enhancing the scale of the tourism sector and extending the season in to the shoulder months. There is a potential to extend eco-friendly marine recreational activities, for example, wildlife safaris to view the seals and other bird and marine life and to use the marine environment more intensively. This potential extends beyond the Sound of Barra to the reefs of East Mingulay. Hence, with the right amount of investment the tourism sector has the potential to deepen and broaden the range of services and tourist experiences it currently offers.

5.6.7 Table 5.4 provides a qualitative overview of the principal costs and benefits which have been identified as part of this assessment. These have been presented in the context of an ecosystem services framework. Overall, the main costs relate to potential restrictions on current fishing practices and future aquaculture development while there are potential benefits in relation to the development of the local tourism sector. While there could be environmental benefits accruing in relation to regulating and supporting services and non-use values these are difficult to value and assess.

Table 5.4: Qualitative summary of impacts relating to designation

Categories	Option 2	Option 3a	Option 3b
<b>Provisioning and production services</b>			
<b>Fisheries</b>	Current fishing activities would continue as before with no additional restrictions on current practices	Trawling and dredging activities would be curtailed within both dSACs	All fishing activities would be curtailed in both dSACs including mobile and static gear
	<b>No change in costs to businesses</b>	<b>Moderate increase in costs to businesses</b>	<b>High increase in costs to businesses</b>
<b>Aquaculture</b>	Any future aquaculture development proposed in the Sound of Barra and East Mingulay is likely to be affected by SAC designation due to the potential impact on the integrity of the sites. Main consequence will be to increase the time and costs associated with implementing these projects.		
	<b>Low to moderate increase in costs to businesses for all options to designate</b>		
<b>Cultural services</b>			
<b>Tourism</b>	The main aspect of cultural services which has been assessed relates to tourism activities. While the direct tourism benefits arising from designation are likely to be limited, better promotion of the Natura 2000 network and increased marketing of the eco-tourism market in the Southern Outer Hebrides would provide the basis for building on the designation as a means of enhancing the scale of the tourism sector and extending the season in to the shoulder months.		
	<b>Low to moderate increase in benefits to businesses for all options to designate</b>		
<b>Regulating and supporting services</b>	These services relate to the natural functions of the marine environment. However, these services are very difficult to value and it has not been possible to assess the value of these services in relation to the two dSACs		
<b>Option use values</b>	Option values are very difficult to assess as future needs and values are by their very nature difficult to predict. As a result, it has not been possible to assess these as part of this analysis. Nevertheless, it is widely accepted that the genetic resources available in the marine environment could in the future be important for improved and more varied food provision and pharmaceutical products. This could be a particularly important issue for the conservation of the East Mingulay reefs.		

5.7

***Quantified cost benefit analysis***

5.7.1

The quantified cost benefit analysis takes account of possible changes in social welfare arising as a result of implementing the policy. The two aspects where it has been possible to provide quantifiable estimates relate to the costs to government and the costs to the existing fishing sector. The assessment is undertaken over a ten year period, which is consistent with the methodology adopted by the JNCC. Future costs are discounted to a present value using the discount rate recommended in the HM Treasury Green Book (3.5%)

*Costs to government*

5.7.2

The estimate of the costs to government arising as a result of the SAC designation have been based on the Financial Memorandum, published in relation to the Marine (Scotland) Bill. This presents a summary of the costs to the Scottish Government for implementing new marine site conservation measures. One off costs are identified in relation to survey costs, site selection, consultation, management schemes and the development of statutory instruments. It has been assumed that there would not be any further costs in relation to site selection and survey costs, but all other costs would still be applicable. It has been assumed that costs arising from designation would be similar in terms of both options 2 and 3.

5.7.3

The one off costs in relation to consultation and management scheme activities would relate primarily to staff costs plus related expenses which would be spread across the various divisions of Marine Scotland depending on the management regime. There would also be resource implications for SNH staff. These costs would relate primarily to developing, implementing and communicating management measures. It is also likely that a local management group would be established with representation from key stakeholders. In addition, further work could also be required to assess the impacts of existing activities.

5.7.4

In addition to these one off costs, there are likely to be ongoing costs in relation to reviewing of consents as well as monitoring and enforcement. The reviewing of consents will generally require input from other advisory bodies as well as the Competent Authority. Some inputs from them may have been required under existing arrangements such as the EIA process, but SAC management is likely to lead to a greater work load.

5.7.5 The cost of monitoring is undertaken on a five year cycle in which there would be the need to monitor the sites as part of the Site Condition Monitoring Programme. In addition, there would be an annual cost for enforcement. Marine Scotland Compliance suggest that no additional surveillance costs would be incurred to ensure compliance with management measures at each site. All fishing vessels over 15 metres are currently subject to satellite tracking, with this size limitation expected to be reduced to 10 or 12 metres in the relatively near future.

5.7.6 There is an element of concurrent presence by marine and aerial surveillance in the vicinity of the areas being considered whilst undertaking existing duties and should be sufficient to ensure large scale compliance with any rules and regulations within the designated areas. However the offshore class Marine Protection Vessels are not particularly suitable for patrolling the Sound of Barra area should a regular presence be required. In addition to this presence, local SAC rangers might be required to ensure smaller scale compliance with any rules and regulations within the designated areas. These costs to government discussed above are summarised in table 5.5.

**Table 5.5: Cost to government arising as a result of designation**

Category	Cost	Frequency
Consultation	£50,000	one off cost
Management schemes	£23,000	one off cost
Statutory instruments	£4,000	one off cost
Implementation - reviewing of consents	£1,000	annual cost
Monitoring	£150,000	every five years
Enforcement	£12,000	annual cost
<b>Cumulative Present Value</b>	<b>£417,750</b>	

Source: Marine Scotland

5.7.7 The one off costs in relation to consultation, management and the development of statutory instruments for site designation, would amount to £77K, while annual costs relating to implementation and enforcement would amount to £13K. In addition, monitoring costs would be undertaken on a five year cycle assumed to cost £150K. Overall, this would amount to a present value (PV) of around £418K over the ten year period<sup>14</sup> of assessment.

5.7.8 *Cost to existing fishing sector*

5.7.9 An assessment of the cost to the existing fishing sector estimates the potential loss in profit arising as a result of potential closures to fishing activity in East Mingulay and the Sound of Barra. The estimate of the loss in net profit has been based on the predicted value of fisheries landings in the two areas. A net profit ratio of 30% has been applied to the value of landings, which has been based on the approach undertaken in JNCC Impact Assessments.

5.7.10 Table 5.6 provides an indication of the potential annual loss in net profits accruing to each of the catching sectors in East Mingulay and the Sound of Barra as a result of closure to fishing activity in these areas. If dredging and trawling activity was curtailed in these two areas, which would be the case in Option 3a, this would result in an estimated annual loss of net profit of over £50K. A ban on all fishing activity, which relates to Option 3b, would have a much more significant impact resulting in a loss of net profit of £262K.

**Table 5.6: Estimated loss in net profit as a result of fishing closure in dSACs**

Species category	East Mingulay dSAC	Sound of Barra dSAC	Both dSACs
Pelagic trawling	£464	£0	£464
Demersal trawling	£4,005	£1,682	£5,687
Shellfish trawling and dredging	£13,791	£34,551	£48,342
Creel fishing	£7,607	£200,041	£207,648
<b>Total</b>	<b>£25,867</b>	<b>£236,274</b>	<b>£262,141</b>

Source: Marine Scotland and Halcrow

<sup>14</sup> This is based on the recommended HM Treasury Green Book discount rate of 3.5%.

### 5.7.11

Table 5.7 provides a summary of the welfare analysis undertaken which indicates the discounted present value (PV) of the cost to government and the cost to the existing fishing sector of the various management options for the two sites. The analysis suggests that the cost to government of designation would amount to a PV of around £836K, while the PV of the cost to the fishing sector (in terms of the loss in profits) would amount to between £0 and £2.18m (Table 5.7).

**Table: 5.7: Summary of the estimated welfare impacts**

Welfare Analysis (Discounted present value)				
			Cost to Government (£000s)	Cost to existing fishing sector (£000s)
Option 2	No further management of existing activities	East Mingulay	£418	£0
		Sound of Barra	£418	£0
		<b>Both sites</b>	<b>£836</b>	<b>£0</b>
Option 3A	No trawling and dredging activity	East Mingulay	£418	£151
		Sound of Barra	£418	£299
		<b>Both sites</b>	<b>£836</b>	<b>£450</b>
Option 3B	Closure to all fishing	East Mingulay	£418	£215
		Sound of Barra	£418	£1,965
		<b>Both sites</b>	<b>£836</b>	<b>£2,180</b>

Source: Halcrow

## 5.8

### ***Economic Impact Assessment***

#### 5.8.1

In addition to the analysis of changes in welfare outlined in the previous section, an economic impact assessment has also been undertaken, which provides estimates of the changes in Gross Value Added (GVA) and employment arising as a result of the potential loss of fisheries landings from the two areas. This assessment has made use of GVA and employment multipliers developed by Seafish<sup>15</sup>, which are detailed in table 5.8 below.

#### 5.8.2

The multipliers assess the economic impact of a £1m change in landings in relation to the pelagic, demersal and shellfish sectors in Scotland. This includes the impacts arising directly as a result of changes in landings relating to both the catching and processing sectors as well as the indirect and induced effects. Indirect effects relate to the effects elsewhere in the supply chain, as the catching and processing sectors will purchase goods and services from other sectors in the economy. Induced effects relate to the impacts arising from changes in household income resulting from the direct and indirect effects. Separate multiplier values for direct, indirect and induced effects have not been calculated by Seafish and so it has not been possible to provide a breakdown of the direct, indirect and induced employment impacts.

**Table 5.8 Economic impact in Scotland arising from £1m change in the value of landings**

	<b>Employment (FTEs)</b>	<b>GVA (£m)</b>
Demersal	31	1.0
Shellfish	67	1.2
Pelagic	23	1.2

Source: Seafish

#### 5.8.3

For example, a £1m annual reduction in the value of shellfish landings would result in a loss of 67 FTE jobs in the Scottish economy, while the equivalent reduction in pelagic landings would result in a reduction of 23 FTE jobs. This includes the direct, indirect and induced impacts relating to the reduction in fisheries landings. The greater change in employment in the shellfish sector

<sup>15</sup> Fraser of Allander Institute, (2007). The Economic impacts of the UK sea fishing and fish processing sectors: an Input-Output analysis, Sea Fish Industry Authority

arises due to the more labour intensive nature of this sector, compared to the pelagic sector.

5.8.4

Using the multiplier values outlined above, Table 5.9 provides estimates of the wider economic impacts arising in the Scottish economy as a result of any potential closure to fishing activity in the two areas. This is based on the estimates of the value of landings which would be affected by the closure of fishing activity in East Mingulay and the Sound of Barra, multiplied by the multiplier values outlined in table 5.8. The biggest impact would arise in relation to the curtailment of creel fishing in the Sound of Barra, which generates £800k annually in Scottish GVA. This is followed by shellfish trawling and dredging in the Sound of Barra which is estimated to contribute £138K per annum in Scottish GVA.

**Table 5.9: Estimated economic impact in Scotland as a result closure of fisheries sectors in the East Mingulay and Sound of Barra dSACs**

Species category	East Mingulay		Sound of Barra	
	Change in GVA	Change in FTEs	Change in GVA	Change in FTEs
Pelagic trawling	£1,856	0.04	£0	0.00
Demersal trawling	£13,349	0.41	£5,606	0.17
Shellfish trawling and dredging	£55,164	3.08	£138,205	7.72
Creel fishing	£30,429	1.70	£800,164	44.68
<b>Total</b>	<b>£100,799</b>	<b>5.23</b>	<b>£943,976</b>	<b>52.57</b>

Source: Halcrow

5.8.5

**Overall, these figures suggest that closure to trawling and dredging activity in both areas (Option 3a) would result in a loss of 11 FTEs in Scotland (including direct, indirect and induced employment) and a loss of over £210K in terms of Scottish GVA.** In terms of a closure relating to all of the fishing in the two areas (Option 3b), the implications would be more substantial, resulting to a loss of around 58 jobs in Scotland and an annual loss of over £1.0m in Scottish GVA (Table 5.10).



**Table 5.10: Summary of estimated economic impact in Scotland as a result closure of fisheries in the East Mingulay and Sound of Barra dSACs**

			Economic Impact Analysis (Annual value)	
			Reduction in Scottish employment (FTEs)	Reduction in Scottish GVA (£000s)
Option 2	No further management of existing activities	East Mingulay	0.00	£0
		Sound of Barra	0.00	£0
		<b>Both sites</b>	<b>0.00</b>	<b>£0</b>
Option 3A	No trawling and dredging activity	East Mingulay	3.5	£70
		Sound of Barra	7.9	£144
		<b>Both sites</b>	<b>11.4</b>	<b>£214</b>
Option 3B	Closure to all fishing	East Mingulay	5.2	£101
		Sound of Barra	52.6	£944
		<b>Both sites</b>	<b>57.8</b>	<b>£1,045</b>

Source: Halcrow

## 5.9

### 5.9.1

#### ***Competition Assessment***

The assessment shown in Table 5.11 below is based on an analysis of the impact of the maximum potential management measures (Option 3) that may be required for the two dSAC. The analysis is centred around the fisheries sector as the evidence suggests that this is sector where the impacts (increased operating costs) are most likely to be felt. The potential designation of the two dSAC is not expected to have a significant impact on competition.

**Table 5.11: Competition Assessment for Sound of Barra and East Mingulay**

<b>Would the proposal:</b>	<b>Fisheries</b>
Directly limit the number or range of suppliers	There may be restrictions or even prohibition of certain types of fisheries which could lead to displacement but is unlikely to limit suppliers, in the short-medium term. Supply may be more elastic in the longer term should profitability decline and people leave the industry
Indirectly limit the number and range of suppliers	<p>A restriction on trawling and dredging activities will lead to displacement of fishing activity. This will increase the operating costs of vessels that currently fish in the Sound of Barra although not necessarily those that fish within the East Mingulay site. It will have no effect on vessels from out with the area continuing to land catches in Barra.</p> <p>There may also be days lost in fishing activity for smaller vessels that are unable to fish outside the Sound of Barra in bad weather. There may be a requirement for fishing vessels to change fishing gear types if management measures impose restrictions. In general, these factors will reduce the profitability of fishing to the owners of vessels. Shellfish processors may be indirectly affected if displaced fishing vessels choose to land their catch elsewhere.</p>
Limit the ability of suppliers to compete	The only real restriction on competition is the ability of some vessels to fish outside of the Sound of Barra – particularly in bad weather.
Reduce suppliers incentives to compete vigorously	No reduction on incentive to compete.

## 5.10

### ***Small firms impact test***

#### 5.10.1

A significant proportion of small and medium sized enterprises (SMEs) in Barra operate within the fisheries and aquaculture sector. They comprise owners of trawlers (employing no more than a crew of 4 people), fish and shellfish processors, salmon fisheries and other marine harvesting. The extent to which they would be affected by the dSAC would depend on how extensive any additional management measures were.

#### 5.10.2

Owners of trawlers and scallop dredgers will potentially face higher operating costs associated with displacement which could affect their profitability. However, the extent to which this will affect profitability will depend on the ability of the vessel owners to pass these costs on through the supply chain; for example to the fish and shellfish processors. Similarly, if the processors can pass these costs on to their customers (which will depend on price and income elasticity of demand) then profitability will be unaffected. Since most customers are offshore, then the domestic base of the local economy is unlikely to be affected by higher costs in the fishing sector.

## 6

## Summary and Conclusions

### 6.1.1

The purpose of this impact assessment has been to provide relevant and meaningful information on current economic activities, future opportunities and the socio-economic impacts potentially associated with the proposed dSACs at the Sound of Barra and East Mingulay. Although both proposed designations have been underpinned by the formal need to safeguard biodiversity features (habitats and species), the broader implications identified for the two sites are notably dissimilar given the differences in the socio-economic fabric. Nevertheless, the overall strategy that forms the basis for such proposed designations remains based on the same set of drivers, objectives and national and international commitments. This includes the acceptance that a network of marine protected areas (including SAC, SPA, and MPA) with various management objectives to support conservation of specific habitats and species, maintain wider ecosystem function and promote an improved and more sustainable use of the marine environment for current and future generations.

### 6.1.2

It has been evident in the course of the stakeholder engagement plan that the proposed designations are viewed with a considerable level of scepticism by a wide range of people. This has raised concerns over the measures and actions that may be decided upon and ultimately taken by authorities who are viewed as being too distant from the local realities, social, economic, cultural etc. Other times, it is the very scientific baseline used to explain and justify the proposed conservation measures that is challenged. More often than not there is concern that once decisions are taken (by others), these inevitably will lead to restrictions, constraints, and limitations being implemented.

### 6.1.3

It appears that although an awareness raising process has been undertaken (which has involved local meetings to explain the site selection process and how a consultation might operate should the Scottish Government seek to proceed further with the designation process), there still remains overall unease about the proposed designations. Further work to develop local stakeholder engagement could include multi-disciplinary presentations that include the various benefits associated with marine conservation as well as informing the community of the socio-economic benefits that might arise from such measures. This approach could go a long way to achieving a more widespread consensus among the local population.

#### 6.1.4

What is clear from the present impact assessment and has been described in the economic baseline section (3) and the potential impact section (5) is that the potential costs and benefits of the various policy options are subject to some uncertainty. The key causes behind this uncertainty include but are not limited to the following:

- (i) Difficulty in quantifying with a high level of precision the monetary turnover generated by the various activities identified and more specifically what proportion of this turnover is generated at the two proposed sites;
- (ii) Difficulty in predicting what management measures might be implemented at the proposed sites once designated (e.g. partial closures; seasonal limitations) and how these might affect the various stakeholders and those related to fisheries in particular;
- (iii) Difficulty in predicting how the various stakeholders and operators might respond to any management measures (e.g. partial closures; seasonal limitations) and the potential costs they might incur;
- (iv) Difficulty in predicting whether limitations, constraints and the application of rules and regulations, might affect future developments, such as additional marine harvesting and marine renewables.

#### 6.1.5

Uncertainty remains on the potential management measures that may actually be introduced following designation and which could affect the fisheries industry and on how operators may react (e.g. move elsewhere, fish less intensively, use fewer types of gear). In order to explore the consequences of designation, a range of scenarios were investigated in relation to the potential management regimes that could be introduced as a result.

#### 6.1.6

Overall, the analysis suggests that creel fishing accounts for the largest proportion of fishing activity, amounting to nearly 80% of the value of landings from the Sound of Barra and East Mingulay dSACs. It is less likely that this sector will be affected by designation. On the other hand, the remaining proportion of fishing activity, accounting to one fifth of fisheries landings from the two areas is more likely to be affected by the management regime arising from the designation of the two sites. This relates to mobile gear fishing activities such as trawling and dredging. Depending on the actual management

measures eventually decided upon, some of this activity could be displaced to areas outside of the Sound of Barra and East Mingulay.

#### 6.1.7

It is estimated that closure of the two dSACs to these mobile catching gear, would result in a maximum loss of landings worth over £181K per annum. The impact of a complete closure of both sites to all forms of fishing could result in a maximum annual loss in fisheries landings of over £870k. In terms of the economic impact analysis, it is estimated that closure to trawling and dredging activity at the two sites would result in over 11FTE job losses in Scotland while this would increase to nearly 58 FTE jobs arising as a result of a closure to all fishing should no displacement of effort occur.

## Appendix A – List of Consultees

### **Local community organisations consulted**

Barra and Vatersay Community Ltd

Castlebay and Vatersay Community Council

Eriskay Community Council

Northbay Community Council

SHAMED

Storas Uibhist - Community Land Trust

Voluntary Action Barra

### **Local business organisations consulted**

Barra Fishing Charters

Barratlantic

Clearwater Paddling

Isle of Barra Beach Hotel

Kallin Shellfish

Sandray Shellfish

Uisge Beatha nan Eilean Ltd

Westbound Adventures

### **Other organisations consulted**

Comhairle nan Eilean Siar

Crown Estate

Highlands and Islands Enterprise

Mallaig and North West Fisheries Association

Marine Harvest

MSP for the Western Isles

Royal Yachting Association (Scotland)

Scallop Association

Scottish Environment Link

Scottish Fishermans Association

Scottish Renewables

Sea Fish Authority

Western Isles Fishermans Association



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## Appendix C – List of current marine SACs and SPAs

### SPA

#### **Map ID - Site Name (EU Code)**

- 1 - Ailsa Craig (UK9003091)
- 2 - Buchan Ness to Collieston Coast (UK9002491)
- 3 - Calf of Eday (UK9002431)
- 4 - Canna and Sanday (UK9001431)
- 5 - Cape Wrath (UK9001231)
- 6 - Copinsay (UK9002151)
- 7 - East Caithness Cliffs (UK9001182)
- 8 - Fair Isle (UK9002091)
- 9 - Fetlar (UK9002031)
- 10 - Flannan Isles (UK9001021)
- 11 - Forth Islands (UK9004171)
- 12 - Foula (UK9002061)
- 13 - Fowlsheugh (UK9002271)
- 14 - Handa (UK9001241)
- 15 - Hermaness, Saxa Vord and Valla Field (UK9002011)
- 16 - Hoy (UK9002141)
- 17 - Marwick Head (UK9002121)
- 18 - Mingulay and Berneray (UK9001121)
- 19 - North Caithness Cliffs (UK9001181)
- 20 - North Colonsay and Western Cliffs (UK9003171)
- 21 - North Rona and Sula Sgeir (UK9001011)
- 22 - Noss (UK9002081)
- 23 - Rousay (UK9002371)
- 24 - Rum (UK9001341)
- 25 - Shiant Isles (UK9001041)
- 26 - St Abb's Head to Fast Castle (UK9004271)
- 27 - St Kilda (UK9001031)
- 28 - Sule Skerry and Sule Stack (UK9002181)
- 29 - Sumburgh Head (UK9002511)
- 30 - Troup, Pennan and Lion's Heads (UK9002471)
- 31 - West Westray (UK9002101)

### **SPAs with marine components**

#### **Map ID - Site Name (EU Code)**

- 32 - Bridgend Flats, Islay (UK9003052)
- 33 - Cromarty Firth (UK9001623)
- 34 - Dornoch Firth and Loch Fleet (UK9001622)
- 35 - Sanday Coast (UK9002331)
- 36 - Firth of Forth (UK9004411)
- 37 - Firth of Tay and Eden Estuary (UK9004121)
- 38 - Glas Eileanan (UK9003211)
- 39 - Gruinart Flats (UK9003051)
- 40 - Inner Clyde (UK9003061)
- 41 - Inner Moray Firth (UK9001624)
- 42 - Laggan, Islay (UK9003053)
- 43 - Loch of Inch and Torrs Warren (UK9003121)
- 44 - Montrose Basin (UK9004031)
- 45 - Moray & Nairn Coast (UK9001625)
- 46 - Oronsay and South Colonsay (UK9020299)
- 47 - South Uist Machair and Lochs (UK9001082)
- 48 - Upper Solway Flats and Marshes (UK9005012)
- 49 - Ythan Estuary, Sands of Forvie and Meikle loch (UK9002221)

### **Offshore SAC**

#### **Map ID - Site Name (EU Code)**

- 50 - Braemar Pockmarks (UK0030357)
- 51 - Darwin Mounds (UK0030317)
- 52 – North West Rockall Bank (UK 0030363) (Not shown on map)
- 53 - Scanner Pockmark (UK0030354)
- 54 - Stanton Banks (UK0030359)
- 55 – Wyville Thomson Boundary (UK0030355)

### **SAC**

#### **Map ID - Site Name (EU Code)**

- 56 - Ascrib, Isay and Dunvegan (UK0030230)
- 57 - Berwickshire and North Northumberland Coast (UK0017072)
- 58 - Dornoch Firth and Morrich More (UK0019806)
- 59 - Eileanan agus Sgeiran Lios mór (UK0030182)

- 60 - Faray and Holm of Faray (UK0017096)
- 61 - Firth of Lorn (UK0030041)
- 62 - Firth of Tay & Eden Estuary (UK0030311)
- 63 - Isle of May (UK0030172)
- 64 - Loch Creran (UK0030190)
- 65 - Loch Laxford (UK0030192)
- 66 - Loch nam Madadh (UK0017070)
- 67 - Loch of Stenness (UK0014749)
- 68 - Loch Roag Lagoons (UK0017074)
- 69 - Lochs Duich, Long and Alsh Reefs (UK0017077)
- 70 - Luce Bay and Sands (UK0013039)
- 71 - Mòine Mhór (UK0019839)
- 72 - Monach Islands (UK0012694)
- 73 - Moray Firth (UK0019808)
- 74 - Mousa (UK0012711)
- 75 - North Rona (UK0012696)
- 76 - North Uist Machair (UK0019804)
- 77 - Obain Loch Euphoirt (UK0017101)
- 78 - Papa Stour (UK0017069)
- 79 - Sanday (UK0030069)
- 80 - Solway Firth (UK0013025)
- 81 - Sound of Arisaig (Loch Ailort to Loch Ceann Traigh) (UK0019802)
- 82 - South-East Islay Skerries (UK0030067)
- 83 - South Uist Machair (UK0012713)
- 84 - St Kilda (UK0013695)
- 85 - Sullom Voe (UK0030273)
- 86 - Sunart (UK0019803)
- 87 - The Vadills (UK0017068)
- 88 - Treshnish Isles (UK0030289)
- 89 - Yell Sound Coast (UK0012687)

## Appendix D – Details of statutory advice provided by SNH for Dornoch Firth and Morrich More SAC in relation to relevant qualifying features

Aquaculture	
Finfish farming	<p><b>Habitats:</b> Finfish farming has the potential to cause deterioration of qualifying habitats and communities through changes in water quality, smothering from waste material and physical disturbance from mooring systems. There is potential for accidental introduction of new non-native species and increasing the spread of existing non-native plants and animals (e.g. <i>Caprella mutica</i> Japanese skeleton shrimp), which are already widely distributed in the UK. Invasive species have the potential to cause deterioration of the qualifying interest by altering community structure and quality.</p> <p><b>Species:</b> Finfish farming has the potential to cause disturbance, injury or mortality to seals through entanglement in anti-predator nets or nets used to re-capture escaped fish, shooting (legal only outwith the close season) to protect fish farm stock from seal damage, or using ADDs. Chemical treatments associated with finfish farming have the potential to adversely affect seals. Boat activity associated with finfish farming has the potential to cause disturbance to seals, particularly during breeding and pupping (late May to end June) and moulting (August) seasons.</p>
Shellfish farming	<p><b>Habitats:</b> This activity has the potential to cause deterioration of the qualifying habitats and communities through physical damage (e.g. installation of mooring blocks and continued scouring by riser chains) and changes in community structure caused by smothering from pseudo-faeces (undigested waste products) and debris (including dead shells) falling from the farm. There is also potential for accidental introduction of new non-native species and increasing the spread within the UK of existing non-native plants and animals (e.g. <i>Sargassum muticum</i> Wireweed), through importation or translocation of shellfish stocks. Invasive species have the potential to cause deterioration of the qualifying interest by altering community structure and quality.</p> <p><b>Species:</b> Shellfish farming has the potential to cause disturbance, injury or mortality to seals through the use of ADDs or other predator control methods (e.g. sonic canon, boat chasing). Boat activity associated with shellfish farming has the potential to cause disturbance to seals, particularly during breeding, pupping and moulting seasons.</p>

<b>Coastal Development</b>	
Agriculture	<b>Habitats:</b> Diffuse run-off from agricultural practices has the potential to cause deterioration of qualifying habitats and communities through the smothering of qualifying interests, and / or altering water quality through discharge of organic and inorganic pollutants.
Civil engineering	<p><b>Habitats:</b> The construction and maintenance of structures, both within and adjacent to the sea have the potential to cause direct loss of qualifying habitat and deterioration of adjacent habitats and communities as tidal currents and therefore coastal processes are affected. For example coastal structures such as linear coastal defences or erosion control measures (e.g. gabions) can affect local sediment suspension and deposition patterns and therefore have the potential to cause deterioration of qualifying habitat, particularly reefs, through smothering. Installation, replacement and maintenance of undersea cables have the potential to cause direct loss of qualifying habitat as well as local deterioration of qualifying habitats and communities.</p> <p><b>Species:</b> The construction and maintenance of structures, both within and adjacent to the sea, have the potential to cause disturbance during the seal breeding, pupping and moulting seasons. This activity also has the potential to cause loss or deterioration of the habitats upon which the seals depend during the same critical periods.</p>
Forestry operations	<b>Habitats:</b> Increased concentrations of dissolved nutrients from fertiliser run-off has the potential to cause deterioration of qualifying habitats and communities. Large-scale run-off of terrestrial sediment, from forestry operations, has the potential to cause deterioration of qualifying habitats, particularly reefs, through smothering.
<b>Discharges / Waste Disposal</b>	
Discharge of commercial effluent	<b>Habitats:</b> Commercial effluent has the potential to cause deterioration of qualifying habitats and communities. This would be through the effects of pollution and / or nutrient enrichment, which may cause subsequent changes in community structure.
Discharge of sewage	<b>Habitats:</b> Sewage effluent (whether treated or untreated) has the potential to cause deterioration of qualifying habitats and communities. This would be through the effects of pollution and / or nutrient enrichment, which may cause subsequent changes in community structure.

<b>Fishing</b>	
Mobile gear: Dredging	<b>Habitats:</b> Benthic dredging has the potential to cause deterioration of qualifying habitats and communities e.g. biogenic reefs (reef created by living organisms) through direct contact with dredge gear, and sedimentation when dredging occurs close to the qualifying interests, particularly reefs.
Mobile gear: Trawling	<b>Habitats:</b> Benthic trawling has the potential to cause deterioration of qualifying habitats and communities e.g. biogenic reefs through direct contact with trawling gear, and sedimentation when trawling occurs close to the qualifying interests, particularly reefs.
Static gear: Netting	<p><b>Habitats:</b> The use of stake-nets for salmon has the potential to cause deterioration of qualifying habitats and communities, particularly fragile and erect reef species, mainly during installation.</p> <p><b>Species:</b> The use of tangle nets, bottom-set nets or salmon stake nets has the potential to cause seal injury or mortality through entanglement. The legal shooting of seals that occurs as a result of protecting salmon stake net equipment has the potential to cause disturbance, injury and mortality to seals.</p>
<b>Gathering / Harvesting</b>	
Bait gathering	<b>Species:</b> Bait gathering on the foreshore has the potential to cause disturbance to seals (particularly during breeding, pupping and moulting seasons) and physical damage and disturbance to associated habitats.
Diver collection of shellfish	<b>Habitats:</b> Collection of shellfish by diving has the potential to cause deterioration of the reef habitats and communities where the target species is a key component of that community, or where the collection method involves the use of invasive techniques (e.g. hydraulic equipment). Diving amongst reefs could cause deterioration and physical damage, in particular to erect and fragile species.
Intertidal collection of shellfish	<b>Species:</b> Collection of shellfish from intertidal areas has the potential to cause disturbance to seals (particularly during breeding, pupping and moulting seasons), mainly caused by intense and prolonged human presence.



<b>Marine Traffic</b>	
Commercial vessels	<p><b>Habitats:</b> The pumping of bilges, discharge of ballast, accidental grounding, or accidental oil (or other chemical) spillage from commercial vessels could occur within or close to this SAC. Such incidents have the potential to cause deterioration of qualifying habitats and communities e.g. biogenic reefs through direct and / or indirect impacts. Local authority emergency plans and oil spill contingency plans should take into account specific qualifying interests and recognise the importance of marine SACs should such incidents occur.</p> <p><b>Species:</b> Seals generally leave an area in which oil is spilled but a small number of individuals may suffer from respiratory problems and die as a result of the spillage of a large amount of oil. There is a risk that a fishing boat or other commercial vessel may run aground in the area spilling diesel and fuel oil. Local authority oil spill contingency plans should take into account the qualifying interests and the importance of the marine SAC, particularly during the seal's breeding, pupping and moulting seasons, should such incidents occur.</p>
<b>Recreational Activities</b>	
Boat anchorages	<p><b>Habitats:</b> Anchors and continual scouring by riser chains have the potential to cause deterioration of qualifying habitats and communities through direct contact with the qualifying interests.</p>
Boat moorings	<p><b>Habitats:</b> Moorings and continual scouring by riser chains have the potential to cause deterioration of qualifying habitats and communities through direct contact with the qualifying interests.</p>
Charter / recreational vessels	<p><b>Habitats:</b> Boats have the potential to cause deterioration of qualifying habitats and communities through repeated launching and recovery in specific areas, accidental grounding, and accidental fuel spillages.</p> <p><b>Species:</b> Charter boats, especially on trips specifically designed to visit seal colonies, have the potential to disturb seals (particularly during the sensitive breeding, pupping and moulting periods) if appropriate guidelines for watching seals are not adhered to.</p>
Other recreational activities	<p><b>Species:</b> Fast, manoeuvrable craft such as jet skis have the potential to cause disturbance, injury and mortality to seals due to noise, erratic speed and direction and collision.</p>

Scientific Research	
Scientific Research	<p><b>Habitats:</b> Research activities have the potential to cause deterioration of qualifying habitats and communities through direct alteration, removal or manipulation of this qualifying interests and their associated species.</p> <p><b>Species:</b> Research activities have the potential to cause disturbance to <b>seals</b>, particularly during the breeding, pupping and moulting seasons.</p>
Military Activity	
Military training and exercises	<p><b>Species:</b> The use of terrestrial vehicles on intertidal areas, prolonged human presence, aircraft noise from low flying jets or helicopters, or noise from explosives have the potential to cause disturbance to seal populations.</p>