



SCOTTISH EXECUTIVE

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Note: This document is only a section of the Final Environmental Report

Scottish Marine Renewables
Environmental Report Section C SEA Assessment: Chapter C5 Protected Sites and Species

Scottish Executive
March 2007

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Glossary & Abbreviations

| | |
|-----------|---|
| JNCC | Joint Nature Conservation Committee |
| NNR | National Nature Reserve. Site designated by Scottish Natural Heritage under the Wildlife and Countryside Act 1981 to protect nationally important natural and semi-natural ecosystems. (All NNRs are also SSSIs) |
| SAC | Special Area of Conservation. Site designated under the 1992 EC Habitats Directive to protect wildlife and habitats listed as being of European importance. |
| UNEP-WCMC | United Nations Environment Programme – World Conservation Monitoring Centre |
| SNH | Scottish Natural Heritage |
| SPA | Special Protection Area. Site designated to protect certain rare or vulnerable bird species under the 1979 EC Birds Directive, and the 1994 UK Regulations. The sites generally support significant numbers of internationally important species |
| SSSI | Site of Special Scientific Interest. Site designated by Scottish Natural Heritage under the Wildlife and Countryside Act 1981 to protect nationally important ecosystems. Sites are of special conservation interest, and include globally scarce habitats and geological formations as well as flora and fauna |

C5 Protected Sites and Species

C5.1 Introduction

Much of the Scottish coastline is designated in the interests of nature conservation (see Figures C5.1 – C5.3) and a review of protected sites and species has been undertaken as part of this SEA.

C5.2 Baseline Environment

C5.2.1 Protected Sites

All sites considered as part of this SEA are located in nearshore or coastal environments only as there are currently no designated offshore protected sites. However, work is being undertaken by the Joint Nature Conservation Committee (JNCC) to designate official offshore Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) under the EC Habitats Directive.

The coastal and nearshore sites reviewed in this chapter include:

International Sites:

- Natura 2000 Sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA))
- Ramsar
- World Heritage Sites

National Sites:

- Marine National Parks (MNR)
- National Nature Reserves (NNR)
- Sites of Special Scientific Interest (SSSI)
- National Scenic Areas
- Geological Conservation Review Sites (GCR)
- Marine Consultation Areas

C5.2.2 *Protected Sites – International*

C5.2.2.1 Natura 2000 Sites

Natura 2000 is a European network of protected sites which represent areas of the highest value for natural habitats and species of plants and animals which are rare, endangered or vulnerable in the European Community. Natura sites are designated under the Habitats Directive (Council Directive 92/43/EEC) which is implemented in Britain by the Conservation (Natural Habitats, &c.) Regulations 1994. Natura sites are designated as Special Protection Areas (SPA) for their bird interest or as Special Areas for Conservation (SAC) for their importance for animal species or habitats.

The Habitats Directive obliges Member States to ensure that appropriate steps are taken to avoid the deterioration of habitats, and habitats of species, as well as significant disturbance of the species. Assessing the potential effects on these sites is specifically related to the stated Conservation Objectives of each Natura 2000 site which safeguard the Qualifying Features of the site as stated in the Natura 2000 designation and the overall maintenance of the sites integrity. Site integrity has been defined as "the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site has been designated". The Conservation Objectives safeguard the habitats of the site, the range, numbers and supporting habitats of the qualifying species.

Special Areas of Conservation

Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended) respectively. In addition to the existing designated sites, which are all in the coastal and Nearshore environment, processes are underway to designate offshore SACs under the Habitats Directive. The number and extent of these sites has not yet been determined, but areas containing potential Annex I Habitats (pAIH) and potential Special Areas of Conservation (pSACs) have been identified by JNCC. Any development proposed within these areas will need to demonstrate that it does not affect any existing Annex I habitat such as reef structures or submerged sandbanks.

There are four species listed on Annex II of the Habitats Directive known to occur in UK marine waters for which selection of offshore SACs will be considered:

- Grey seal (*Halichoerus grypus*)
- Common seal (*Phoca vitulina*)
- Bottlenose dolphin (*Tursiops truncatus*)
- Harbour porpoise (*Phocoena phocoena*)

Annex II species - otter and river lamprey (or lampern) occur only in inshore and inland waters. Sea lamprey, sturgeon and shad are all rare in UK offshore waters and without regular places of occurrence.

Annex I habitats for which SACs may be selected in UK offshore waters are:

- Sandbanks which are slightly covered by sea water all the time
- Reefs
- Submarine structures made by leaking gases
- Submerged or partially submerged sea caves

Existing SACs within the study area which contain marine or intertidal features are listed in Table C5.1 below. In addition to the SACs located within the SEA study area, this study also considers neighbouring SACs which contain mobile qualifying species that occasionally migrate into the SEA study area. For this SEA, the only relevant additional site is the Moray Firth SAC, which is designated for bottlenose dolphin. Qualifying species are those present in sufficient population size and density to qualify for SAC site designation, but are not the primary reason for selection of the site in question. Other site features are Annex I habitats or Annex II species which are present, but in sufficient population size and density to qualify for site selection.

Table C5.1: Special Areas of Conservation

| Study Area | Site Name | Primary Reason for Site Designation | Other Site Features (Qualifying Features) | Other Site Features (Non-Qualifying) | Potential Resource Area | SEA Chapter |
|----------------|-------------------------|---|--|---|-----------------------------------|-------------|
| Northern Isles | Faray and Holm of Faray | Grey Seals | None listed | Reefs Subtidal sandbanks Sea caves | Tidal | C6 C9 |
| Northern Isles | Loch of Stenness | Saline lagoons | None listed | None listed | Outside main interest areas | C6 |
| Northern Isles | Mousa | Common seal | Reefs Sea caves | Harbour Porpoise | Outside of main areas of interest | C6 C9 |
| Northern Isles | Papa Stour | Reefs Sea caves | Subtidal sandbanks | Harbour Porpoise | Wave | C6 C9 |
| Northern Isles | Sanday | Reefs Common seals | Tidal sandbanks and mudflats Subtidal sandbanks | Harbour Porpoise | Wave and Tidal | C6 C9 |
| Northern Isles | Sullom Voe | Shallow inlets and bays | Saline lagoons Reefs | Harbour Porpoise | Outside of main areas of interest | C6 C9 |
| Northern Isles | The Vadills | Coastal lagoons | None listed | Reefs Tidal rapids Saline lagoons Mearl beds | Outside of main areas of interest | C6 C9 |
| Northern Isles | Yell Sound Coast | Otter Common seals | None listed | Coastal lagoons Reefs Subtidal sandbanks Sea caves | Tidal | C6 C9 |
| North Coast | Invernaver | Coastal habitats (dunes) | Coastal habitats (dunes) | Intertidal mudflats and sandflats Atlantic salmon | Wave | C6 |
| North Coast | Durness | Coastal habitats (dunes) | None listed | Otter | Wave | C6 C9 |
| Western Isles | Loch Laxford | Large shallow inlets and bays | Reefs | Otter | Wave | C6 C9 |
| Western Isles | Loch nam Madadh | Coastal lagoons Large shallow inlets and bays Otter | Subtidal sandbanks Intertidal mudflats and sandflats Reefs | Atlantic salmon Harbour porpoise Grey seals Common seals | Outside of main areas of interest | C6 C9 |
| Western Isles | Loch Roag | Saline Lagoons | None listed | Tidal Rapids Reefs | Wave | C6 |
| Western Isles | Monach Islands | Coastal habitats (machairs) Grey seal | Coastal habitats (dunes) | None listed | Wave | C6 C9 |

| Study Area | Site Name | Primary Reason for Site Designation | Other Site Features (Qualifying Features) | Other Site Features (Non-Qualifying) | Potential Resource Area | SEA Chapter |
|-----------------|---|--|---|--|--------------------------------|-------------|
| Western Isles | North Uist Machair | Coastal habitat (machairs) | Terrestrial habitats and species | Grey Seals Common Seals Otter Salmon | Wave | C6 C9 |
| Western Isles | Sound of Barra | Subtidal sandbanks (<i>Zostera marina</i> Maerl beds) | None listed | None listed | Wave Tidal | C6 |
| Western Isles | South Uist Machair | Terrestrial and coastal habitats (machair/dunes) | Coastal lagoons Otter | Grey Seals | Wave | C6 C9 |
| Outer Isles | North Rona | Grey seal | Reefs Sea cliffs Sea caves | None listed | Wave | C6 C9 |
| Outer Isles | St Kilda | Reefs Sea cliffs Sea caves | None listed | Bottlenose Dolphin Harbour Porpoise Grey Seals | Wave | C6 C9 |
| Inner Isles | Ascrib, Isay and Dunvegan | Common Seal | None listed | Harbour Porpoise | Outside main areas of interest | C6 C9 |
| Inner Isles | Lochs Duich, Alsh and Long Reefs Marine SAC | Reefs | None listed | Harbour porpoise Grey seals Common Seals Subtidal sandbanks <i>Phellia gausapata</i> (nationally scarce species) | Not within main interest areas | C6 C9 |
| Inner Isles | Rum | Otter Terrestrial and coastal habitats | Vegetated sea cliffs | Sea caves | Wave | C6 C9 |
| Inner Isles | Sound of Arisaig | Tidal sandbanks | Reefs Otter Grey Seals Common Seals Harbour Porpoise | Maerl beds Subtidal sandbanks | Wave | C6 C9 |
| Argyll and Bute | Eileanan agus Sgeiran Lios mór | Common Seals | None listed | None listed | Wave and Tidal | C9 |
| Argyll and Bute | Firth of Lorn | Reefs | None listed | Harbour porpoise | Wave and Tidal | C6 C9 |
| Argyll and Bute | Loch Creran | Biogenic Reefs (<i>Serpula vermicularis</i> Reefs) | <i>Modiolus</i> Reefs | Common seal | Wave | C6 C9 |
| Argyll and Bute | Loch Sunart | Coastal habitats (dunes) | Reefs Otter | Atlantic salmon Harbour porpoise Common seals | Wave | C6 C9 |

| Study Area | Site Name | Primary Reason for Site Designation | Other Site Features (Qualifying Features) | Other Site Features (Non-Qualifying) | Potential Resource Area | SEA Chapter |
|-----------------------|--------------------------|---|---|---|-----------------------------------|-------------|
| Argyll and Bute | Moine mhor | Terrestrial habitats (bogs) | Intertidal mud flats Atlantic salt meadow Otter | None listed | Outside of main areas of interest | C6 C9 |
| Argyll and Bute | Southeast Islay Skerries | Common seals | None listed | None listed | Wave | C9 |
| Argyll and Bute | Sunart | Terrestrial habitats Otter | Reefs | Harbour Porpoise Common seals | Wave | C6 C9 |
| Argyll and Bute | Treshnish Isles | Grey Seals | Reefs | Harbour Porpoise | Wave | C6 C9 |
| North Channel | Luce Bay | Large shallow inlets and bays Coastal habitats (dunes) | Intertidal Mudflats and sandflats Subtidal mudflats and sandflats Reefs | Shallow inlets and Bays Otter Grey Seals | Outside of main areas of interest | C6 C9 |
| North Channel | Solway Firth | Sub-tidal sandbanks Estuaries Intertidal mudflats and sandflats Salicornia and other annuals colonising mud and sand Coastal habitats Sea lamprey River lamprey | Reefs Coastal habitats (dunes) | Harbour Porpoise | Outside of main areas of interest | C6 C9 |
| Outside of study area | Moray Firth | Bottlenose Dolphin | Subtidal sandbanks | Harbour porpoise Grey Seals Common Seals Otter | Outside main areas of interest | C6 C9 |

Source: JNCC, 2006

Special Protection Areas (SPAs)

In 1979, the European Community adopted the Council Directive on the Conservation of Wild Birds (79/409/EEC). This Directive (see Appendix 2) is usually referred to as the Birds Directive. It provides for the protection, management and control of naturally occurring wild birds within the European Union through a range of mechanisms. One of the key provisions is the establishment of an internationally co-ordinated network of protected areas. In the UK, the provisions of the Birds Directive are implemented through the Wildlife & Countryside Act 1981 (as amended).

In addition to the existing designated sites (listed in Table C5.2), which are all in the coastal and nearshore environment, processes are underway to designate marine SPAs under the Birds Directive. As with the SACs the locations of marine SPAs are also currently being developed by JNCC.

Recent work by JNCC has aimed to establish the size of areas used seaward of colonies for loafing. Distributions of rafts of birds close to the colony have been surveyed in some detail using boat-based surveys and radio-tracking. This has led to recommendations that breeding colony SPAs should be extended out by a distance of 1km for common guillemot, razorbill and Atlantic puffin (McSorley *et al.* 2003), 2km for gannets (McSorley *et al.* 2003) and 4-9km for Manx shearwaters (depending on colony, McSorley *et al.* 2006).

Table C5.2 lists SPAs both within the study area itself, and also those SPA sites located adjacent to the study area. Foraging can take place well outside SPA boundaries and, as has been observed in wind farm study areas, birds can be present near developments situated tens of miles from SPAs. The area for which relevant SPAs have been identified therefore extends east of the study area round the north coast to Peterhead, and as far south as the southern coast of the Solway Firth. Note only those SPAs designated for marine bird species are listed in the table below.

Table C5.2: Special Protection Areas

| Study Area | Site Name | Qualifying Species | Wave or Tidal Development Area | SEA Chapter |
|----------------|--------------------------------------|--|--------------------------------|-------------|
| Northern Isles | Auskerry | European Storm-Petrel (B); Arctic tern (B) | Outside main areas of interest | C8 |
| Northern Isles | Calf of Eday | Seabird assemblage (B) | Wave | C8 |
| Northern Isles | Copinsay | Great black-backed gull (B); Black-legged Kittiwake (B); Common guillemot (B); Seabird assemblage (B) | Outside main areas of interest | C8 |
| Northern Isles | East Sanday Coast | Purple sandpiper (W); Ruddy turnstone (W) | Wave and tidal | C8 |
| Northern Isles | Fair Isle | Northern fulmar (B); European shag (B); Arctic Skua (B); Great Skua (B); Black-legged Kittiwake (B); Arctic tern (B); Common guillemot (B); Razorbill (B); Atlantic puffin (B); Fair Isle wren (B); Seabird assemblage (B) | Wave | C8 |
| Northern Isles | Fetlar | Northern fulmar (B); Whimbrel (B); Red-necked phalarope (B); Arctic Skua (B); Great Skua (B); Arctic tern (B); Black Guillemot (B); Dunlin (B); Seabird assemblage (B) | Tidal | C8 |
| Northern Isles | Foula | Leach's storm-petrel (B); Great Skua (B); Arctic tern (B); Common guillemot (B); Atlantic puffin (B); Seabird assemblage (B) | Wave | C8 |
| Northern Isles | Hermaness, Saxa Vord and Valla Field | Red-throated diver (B); Northern fulmar (B); Northern gannet (B); European shag (B); Great Skua (B); Common guillemot (B); Atlantic puffin (B); Seabird assemblage (B) | Wave | C8 |
| Northern Isles | Hoy | Red-throated diver (B); Great Skua (B); Seabird assemblage (B) | Wave | C8 |
| Northern Isles | Lochs of Spiggie and Brow | Whooper swan (W) | Wave | C8 |
| Northern Isles | Marwick Head | Black-legged Kittiwake (B); Common guillemot (B); Seabird assemblage (B) | Wave | C8 |
| Northern Isles | Mousa | European storm-petrel (B); Arctic tern (B) | Outside main areas of interest | C8 |
| Northern Isles | Noss | Northern fulmar (B); Northern gannet (B); Great Skua (B); Black-legged Kittiwake (B); Common guillemot (B); Seabird assemblage (B) | Outside main areas of interest | C8 |
| Northern Isles | Orkney Mainland Moors | Red-throated diver (B); Short-eared owl (B) | Wave | C8 |
| Northern Isles | Otterswick and Graveland | Red-throated diver (B) | Wave and tidal | C8 |
| Northern Isles | Papa Stour | Arctic tern (B) | Wave | C8 |

| Study Area | Site Name | Qualifying Species | Wave or Tidal Development Area | SEA Chapter |
|----------------|------------------------------------|---|--------------------------------|-------------|
| Northern Isles | Papa Westray (North Hill and Holm) | Arctic tern (B) | Wave and tidal | C8 |
| Northern Isles | Ramna Stacks and Gruney | Leach's storm-petrel (B) | Wave | C8 |
| Northern Isles | Ronas Hill ù North Roe and Tingon | Red-throated diver (B); Great Skua (B) | Wave | C8 |
| Northern Isles | Rousay | Arctic Skua (B); Black-legged Kittiwake (B); Arctic tern (B); Seabird assemblage (B) | Wave | C8 |
| Northern Isles | Sumburgh Head | Arctic tern (B); Seabird assemblage (B) | Tidal | C8 |
| Northern Isles | West Westray | Northern fulmar (B); European shag (B); Arctic Skua (B); Great Skua (B); Mew gull (B); Herring gull (B); Black-legged Kittiwake (B); Arctic tern (B); Common guillemot (B); Razorbill (B); Black Guillemot (B); Atlantic puffin (B); Seabird assemblage (B) | Wave | C8 |
| Pentland Firth | Pentland Firth Islands | Arctic tern (B) | Tidal | C8 |
| Pentland Firth | Switha | Barnacle goose (W) | Outside main areas of interest | C8 |
| North Coast | Cape Wrath | Black-legged Kittiwake (B); Common guillemot (B); Razorbill (B); Seabird assemblage (B) | Wave and tidal | C8 |
| North Coast | North Caithness Cliffs | Northern fulmar (B); Black-legged Kittiwake (B); Common guillemot (B); Razorbill (B); Seabird assemblage (B) | Wave and tidal | C8 |
| North Coast | North Sutherland Coastal Islands | Barnacle goose (W) | Wave | C8 |
| Western Isles | Flannan Isles | European Storm-Petrel (B); Leach's storm-petrel (B); Common guillemot (B); Razorbill (B); Atlantic puffin (B); Seabird assemblage (B) | Wave | C8 |
| Western Isles | Handa | Arctic Skua (B); Great Skua (B); Black-legged Kittiwake (B); Common guillemot (B); Razorbill (B); Seabird assemblage (B) | Outside main areas of interest | C8 |
| Western Isles | Lewis Peatlands | Red-throated diver (B); Black-throated diver (B); European golden plover (B); Common greenshank (B); Dunlin (B); | Wave | C8 |
| Western Isles | Mingulay and Berneray | Northern fulmar (B); European shag (B); Black-legged Kittiwake (B); Common guillemot (B); Razorbill (B); Seabird assemblage (B) | Wave | C8 |
| Western Isles | Mointeach Scadabhaigh | Red-throated diver (B); Black-throated diver (B) | Wave | C8 |
| Western Isles | Monach Isles | Barnacle goose (W); Common tern (B); Little tern (B); Black Guillemot (B) | Wave | C8 |
| Western Isles | North Uist Machair and Islands | Barnacle goose (W); Eurasian oystercatcher (B); Ringed plover (B); Ringed plover (W); Common redshank (B); Ruddy turnstone (W); Dunlin (B); Breeding bird assemblage (B) | Wave and tidal | C8 |
| Western Isles | Shiant Isles | Northern fulmar (B); European shag (B); Barnacle goose (W); Common guillemot (B); Razorbill (B); Atlantic puffin (B); Seabird assemblage (B) | Outside main areas of interest | C8 |
| Western Isles | South Uist Machair and Lochs | Greylag goose (B); Eurasian oystercatcher (B); Ringed plover (W); Ringed plover (B); Northern lapwing (B); Sanderling (W); Common snipe (B); Common redshank (B); Little tern (B); Dunlin (B); Breeding bird assemblage (B) | Wave | C8 |

| Study Area | Site Name | Qualifying Species | Wave or Tidal Development Area | SEA Chapter |
|--------------------|---|--|--------------------------------|-------------|
| Outer Islands | North Rona and Sula Sgeir | Northern fulmar (B); European Storm-Petrel (B); Leach's storm-petrel (B); Northern gannet (B); Great black-backed gull (B); Black-legged Kittiwake (B); Common guillemot (B); Razorbill (B); Atlantic puffin (B); Seabird assemblage (B) | Wave | C8 |
| Outer Islands | St Kilda | Northern fulmar (B); Manx shearwater (B); European Storm-Petrel (B); Leach's storm-petrel (B); Northern gannet (B); Black-legged Kittiwake (B); Common guillemot (B); Razorbill (B); Atlantic puffin (B); Seabird assemblage (B) | Wave | C8 |
| Outer Islands | Sule Skerry and Sule Stack | European storm-petrel (B); Leach's storm-petrel (B); Northern gannet (B); European shag (B); Atlantic puffin (B); Seabird assemblage (B) | Wave | C8 |
| Inner Isles | Canna and Sanday | Seabird assemblage (B) | Wave and tidal | C8 |
| Inner Isles | Priest Island (Summer Isles) | European storm-petrel (B) | Outside main areas of interest | C8 |
| Inner Isles | Rum | Red-throated diver (B); Manx shearwater (B); Seabird assemblage (B) | Wave | C8 |
| Argyll & Bute | Ailsa Craig | Northern gannet (B); Lesser black-backed gull (B); Razorbill (B); Seabird assemblage (B) | Outside main areas of interest | C8 |
| Argyll & Bute | Bridgend Flats, Islay | Barnacle goose (W) | Wave | C8 |
| Argyll & Bute | Coll | Greenland white-fronted goose (W); Barnacle goose (W) | Wave and tidal | C8 |
| Argyll & Bute | Eilean na Muice Duibhe (Duich Moss), Islay | Greenland white-fronted goose (W) | Wave | C8 |
| Argyll & Bute | Glas Eileanan | Common tern (B) | Tidal | C8 |
| Argyll & Bute | Gruinart Flats, Islay | Greenland white-fronted goose (W); Barnacle goose (W); Light-bellied brent goose (W) | Wave | C8 |
| Argyll & Bute | Inner Clyde Estuary | Common redshank (W) | Outside main areas of interest | C8 |
| Argyll & Bute | Laggan, Islay | Greenland white-fronted goose (W); Barnacle goose (W) | Wave | C8 |
| Argyll & Bute | North Colonsay and Western Cliffs | Red-billed chough (B); Seabird assemblage (B) | Wave | C8 |
| Argyll & Bute | Rinns of Islay | Whooper swan; Greenland white-fronted goose (W); Common Scoter (B); Red-billed chough (B) | Wave and tidal | C8 |
| Argyll & Bute | Slúibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast) | Greenland white-fronted goose (W); Barnacle goose (W); Eurasian oystercatcher (B); Ringed plover (W); Ringed plover (B); Common redshank (B); Ruddy turnstone (W); Dunlin (B) | Wave | C8 |
| North Channel | Loch of Inch and Torrs Warren | Greenland white-fronted goose (W) | Outside main areas of interest | C8 |
| Outside Study Area | North Caithness Cliffs | Northern fulmar (B); Black-legged kittiwake (B); Common guillemot (B); Razorbill (B); Seabird assemblage (B) | Outside Main Areas of interest | C8 |

Source: JNCC, 2006

C5.2.2.2

Ramsar Sites

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. Originally intended to protect sites of importance especially as waterfowl habitat, the Convention has broadened its scope over the years to cover all aspects of wetland conservation, recognising wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. The Convention adopts a broad definition of wetland, namely "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres". Wetlands "may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands". Ramsar sites in the study area are listed in Table C5.3 below.

Table C5.3: Ramsar Sites within the Study Area

| Study Area | Site Name | Site Description |
|----------------|-----------------------------------|---|
| Northern Isles | East Sanday Coast | The site comprises inland, marine and coastal wetlands. The coastline consists of rocky and sandy sections, sand dunes, machair habitats, intertidal flats and saltmarsh. It supports greater than 20,000 waterfowl, including <i>Calidris maritima</i> and <i>Arenaria interpres</i> . Human activities include nature conservation and tourism within the site, and fishing, grazing, and mineral exploration in the vicinity. |
| Northern Isles | Ronas Hill - North Roe and Tingon | Most of the site is composed of active blanket bog with numerous acidic lochans and pools that support a typical peatland avifauna. It provides habitat for common seal (<i>Phoca vitulina</i>) and otter (<i>Lutra lutra</i>), and the invertebrate fauna includes the arctic water flea (<i>Eurycerus glacialis</i>). Human activities include tourism, recreation, fishing, and grazing. |
| Western Isles | Loch an Duin | This site is important in the British Isles for its complex system of freshwater, brackish and sea lochs, and tidal channels. It includes part of the northeast coastland of North Uist and some of the adjacent islands and skerries. The comprehensive range of salinities, from freshwater to brackish and saltwater, is reflected in the associated plant and animal communities, which include the northern forms of some seaweeds. The habitat types of the coastland and islands range from moorland to maritime grassland. The site is also important for its geomorphology, as it is one of the best fjardic loch systems in Great Britain. |
| Western Isles | North Uist Machair and Islands | The site comprises "machair" areas (grassland upon sand, commonly behind coastal sand dunes in north western Scotland) which show a range of habitats from intertidal sand and rock through sand dunes and dune slacks to calcareous coastal plain and acid grassland. The site contains freshwater wetlands, including nutrient-rich and average nutrient machair loch, important freshwater marshes and fens, wet and dry machair and saltmarsh. The area supports a rich and diverse range of plant communities, including some nationally scarce plants and mosses, and supports internationally important numbers of Dunlin and Ringed Plover during the breeding season and Barnacle Goose, Ringed Plover, and Turnstone during the winter. The extended designation now includes four sites on the west and north coasts of North Uist and all or part of three islands in the Sound of Harris south of Lewis and Harris. The RSPB maintains a small visitors' centre and guided walks at the Balranald Bog part of the site. The spread of the invasive American mink is considered to be a potential threat and measures are being taken. Human activities include nature conservation, tourism, and permanent pastoral agriculture. |
| Western Isles | South Uist Machair and Lochs | A complex site that includes inland, marine and coastal wetlands, with outstanding examples of relict woodland, moorland, blanket bog, freshwater marsh, salt marsh, coastal dunes, and sandy rock shores. Part of the largest "machair" (sandy coastal plain) system in the British Isles. Coastal dunes with dune slacks grade into the machair plain consisting of shallow, nutrient-rich lochs, associated fens and marshes. The site is important for wintering and breeding waterfowl such as <i>Anser anser</i> (4.8% of the breeding population) and <i>Charadrius hiaticula</i> (2.5% of the breeding population). The machair is used for traditional rotational cultivation and grazing, as well as for nature conservation, tourism, and recreation. Extended on 01/12/97 from the Ramsar Site Loch Druidibeg, Loch a'Machair & Loch Stilligarry, a UNESCO Biosphere Reserve. |
| Argyll & Bute | Bridgend Flats, Islay | An area of sand and mudflats backed by saltmarsh. An important feature of the site is the well-developed transition from upper saltmarsh to freshwater marsh and fen, which exhibits a high botanical diversity. Internationally important numbers (up to 14,000 birds) of geese from the Greenland breeding population roost at the site. |

| Study Area | Site Name | Site Description |
|---------------|----------------------------------|---|
| Argyll & Bute | Coll | The site supports substantial areas of maritime heath, blanket mire, and open water. The occurrence and botanical composition reflect the long interaction between landforms and low-intensity agriculture. The site supports internationally important numbers of geese, together with several nationally rare wetland plant species. Human activities include tourism, livestock grazing, hunting, and fishing. |
| Argyll & Bute | Eilean na Muice Duibhe | An area of low-level blanket mire bounded by two rivers, with scattered peaty pools and lochans. The mire vegetation is oceanic in character, with hummocks of different mosses and stands of <i>Rhynchospora alba</i> . Breeding birds include <i>Gavia stellata</i> , <i>Circus cyaneus</i> , <i>Calidris alpina</i> and <i>Tringa totanus</i> . The area forms a night-time roosting and feeding area for internationally important numbers of wintering geese of the Greenland breeding population. Human activities include drainage of surrounding areas and peat cutting. |
| Argyll & Bute | Gruinart Flats | A sea loch with extensive intertidal mud and sand flats, saltmarsh, blanket mire, and a well-developed dune complex. The area supports internationally important numbers of wintering and passage geese (<i>Branta leucopsis</i>) of the Greenland breeding population, and over 95% of the Greenland breeding population stages at the site in autumn. Various other breeding birds, including the globally threatened <i>Crex crex</i> , use the area. |
| Argyll & Bute | Rinns of Islay | A mosaic of natural and semi-natural habitats including bog, moorland, blanket mires, dune and maritime grasslands, and farmland. The site supports a peatland flora of exceptional interest that includes several nationally scarce wetland species. An important staging area for internationally important numbers of Sandwich Tern <i>Sterna sandvicensis</i> and redshank <i>Tringa totanus</i> , and nationally important numbers of Ringed Plover <i>Charadrius hiaticula</i> and sanderling <i>Calidris alba</i> . The site supports a diverse assemblage of breeding waders and internationally important numbers of wintering geese <i>Anser albifrons flavirostris</i> . Human activities include livestock grazing, recreation, fishing, and hunting. Extended on 27/11/95 to include former Ramsar Sites Feur Lochain and Glac na Criche. |
| Argyll & Bute | Sleibhtean agus Cladach Thiriodh | The site includes significant portions of a small island west of the Isle of Mull in the Inner Hebrides, consisting of two zones: an intertidal sector comprising rocky shore, sandy bays, and shingle shore, and an inland sector comprising "machair" (sandy coastal) plain, marsh, and wet moorland with one large and several small lochs and numerous pools. The inland areas provide roost sites for internationally important numbers of wintering geese from Greenland and breeding sites for a variety of wader species, whilst the intertidal sectors support similarly significant numbers of wintering wader populations. Several of the lochs support rich aquatic plant communities including a range of nationally scarce and rare species and the site provides an excellent representative of dune and machair habitats. Sheep and cattle grazing is the main land use of the site; disturbance from ditching and clearance by local crofters is being addressed by management agreements. Features of archaeological and historical interest are mentioned in the datasheets but no details have been provided. |
| Argyll & Bute | Inner Clyde | A long narrow, heavily industrialized estuary near Glasgow on the west coast of Scotland, consisting mostly of tidal mudflat with a shoreline of unmanaged semi-natural coastal vegetation; saltmarsh is also present. In winter, the site supports internationally important numbers of redshank <i>Tringa totanus</i> . Sport fishing and hunting, in addition to navigation, are practiced in the area. Dredging and pollution from domestic sewage and oil are considered to be adverse factors, but monitoring is intended and long-term improvements in water quality are expected. |
| North Channel | Loch of Inch and Torrs Warren | The area is composed of two separate sites: a large nutrient-rich freshwater loch including well-developed fen communities, and an area of foreshore and sand dunes. In winter, both components of the site support internationally important numbers of Greenland White-fronted Geese (<i>Anser albifrons flavirostris</i>). The area is used for nature conservation, military activities, pastoral agriculture, tourism, and hunting. |
| North Channel | Upper Solway Flats and Marshes | Bordering Scotland, the extensive flats and marshes form one of the largest and most important continuous areas of intertidal habitat in Britain. The site exhibits an outstanding display of vegetational transition from seaward edge communities through grassy saltmarsh to mature marsh. The estuary is internationally important for numerous species of wintering waterbirds, whose numbers reach 121,325 individuals and include the entire Svalbard breeding population of the goose <i>Branta leucopsis</i> . The site is a vital estuary link used by various migrating waders, and the area is used for recreation, fishing, and grazing. Extended 30/11/92 from the former Ramsar Site Rockcliffe Marsh. |

Source: Ramsar Convention (<http://www.ramsar.org/>)

C5.2.2.3 World Heritage Sites

World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention. The UK's ratification of the Convention also extends to its Overseas Territories and Crown Dependencies. These sites are designated for their globally important cultural or natural interest and require appropriate management and protection measures.

There is one World Heritage Site in the study area, St Kilda (Outer Isles). St Kilda is designated for its "outstanding natural features and wildlife", and is described as being an outstanding example of the ecological colonisation of a remote island and of the genetic divergence caused by the isolation of small populations (UNEP-WCMC, 2007). The area designated includes the island itself and the surrounding waters, including areas used by the bird colonies of the island and important seabed communities.

The St Kilda seabird population, with 330,000 breeding pairs of 17 species, including migratory birds, is the largest seabird colony in the British Isles and one of the largest concentrations in the North Atlantic. A total of 228 sea and water bird species have been recorded though only 140 species have been seen over the course of one year. This includes the world's largest colony of Northern gannet - 60,428 pairs in 1999/2000, 23.6% of the north-eastern Atlantic population; the largest and oldest British colony of northern fulmar (67,000 pairs); and 30% of the British population of the Atlantic puffin (135,732 pairs). This species was formerly estimated at two to three million pairs but numbers have dropped substantially. Predation by a small but growing number of skuas (170 pairs) may be partly responsible. The islands are also one of the very few European breeding stations of Leach's storm petrel, with 92% of the British population (45,433 pairs), and also of the European storm-petrel (1,121 pairs). The numbers of common guillemot (23,378) are also very high. However, the total populations recorded fluctuate from year to year.

C5.2.3 *Protected Sites – National*

C5.2.3.1 Sites of Special Scientific Interest (SSSI)

SSSIs have been developed since 1949 as the National suite of sites providing statutory protection for the best examples of the UK's flora, fauna, geological or physiographical features. These sites are also used to underpin other national and international nature conservation designations. Most SSSIs are privately-owned or managed; others are owned or managed by public bodies or non-government organisations. The SSSI designation may extend into intertidal areas out to the jurisdictional limit of local authorities, generally Mean Low Water of Spring tides in Scotland. There is no provision for marine SSSIs beyond low water mark.

Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs have been renotified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Nature Conservation (Scotland) Act 2004.

Details of SSSIs in the study area are provided in Appendix C5.A.

C5.2.3.2 Coastal and Marine National Parks

In March 2006, Scottish Natural Heritage (SNH) issued their advice to the Scottish Executive regarding Coastal and Marine National Parks, in response to the request for advice made in June 2005. Scottish Ministers have made a commitment to establish a Coastal and Marine National Park in 2008 under the National Parks (Scotland) Act 2000.

The four main objectives for any National Park in Scotland are: to conserve and enhance the natural and cultural heritage; to promote sustainable use of the natural resources; to promote understanding and enjoyment of the special qualities of the area; and to promote sustainable economic and social development of the area's communities.

SNH recommended that the National Park Authority established to manage this area focuses initially on planning and enabling practical work to be delivered, using its basic powers and functions and drawing on modest programme expenditure. Following the preparation of a Park Plan, further consideration should be given to any regulatory powers that the Authority may need. In this way, the concept of a Coastal and Marine National Park can grow incrementally, having built consensus and good will.

A long list of possible areas had previously been identified, based on heritage values and the coherence of defined areas. Most were in the north and west, including many of the island groups. The process of short-listing identified ten possible areas for future National Park status:

- The Solway Firth;
- Argyll Islands and Coast;
- Ardnamurchan, Small Isles, and South Skye coast;
- North Skye Coast and Wester Ross; and
- North Uist, Sound of Harris, Harris and South Lewis.
- Shetland
- Orkney
- South Uist and Barra
- Clyde Firth
- Moray Firth

If taken forward, further work will be required to refine these areas and to consider in detail their seaward and terrestrial extent and specific boundaries.

C5.2.3.3 Marine Consultation Areas

Marine Consultation Areas (MCA) were introduced in 1990 by the then Nature Conservancy Council. Although not statutorily designated, they are of particular distinction in respect of the quality and sensitivity of their marine environment and nature conservation value. There are 29 MCAs in Scotland, the majority of which are located in Western and Northern Scotland and the Western and Northern Isles. A map of marine consultation areas in the study area is presented below.

C5.2.3.5 National Scenic Areas

National Scenic Areas (NSAs) were designated by the Secretary of State for Scotland in 1980 as the best of Scotland's landscapes, deserving special protection in the nation's interest. Special development control measures for the 40 National Scenic Areas in Scotland were introduced by the Scottish Development Department (SDD) through SDD Circular No 20/1980. National Planning policy for NSAs is set out in NPPG14 on Natural Heritage. National Scenic Areas are included in the Seascape chapter (Chapter C19).

C5.2.3.6 National Nature Reserves

NNRs contain examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats or to provide special opportunities for scientific study of the habitats, communities and species represented within them, also for recreation.

NNRs are declared by the statutory country conservation agencies under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981.

Table C5.4: National Nature Reserves in the Study Area

| Study Area | Site Name | Site Description |
|----------------|---------------------|---|
| Northern Isles | Hermaness | Overlooking Muckle Flugga, Britain's most northerly point, Hermaness provides a habitat for over 100,000 seabirds, 16,000 pairs of gannets and more than 50,000 puffins. |
| Northern Isles | Noss | Breeding bird colonies - 45,000 guillemots, 7000 pairs of gannets and several thousand fulmars, kittiwakes and puffins crowd its noisy ledges during the breeding season. |
| Western Isles | Monach Islands | During autumn the Monach islands support one of the most important breeding colonies of Atlantic grey seals in the world. The Monach Isles are also home to large numbers of seabirds, including black guillemots and terns. |
| Inner Isles | Rum | The island of Rum holds 200 archaeological sites and monuments. There's also a unique mountain top colony of Manx shearwaters, host to around a third of the world population, and Rum was the base for reintroducing sea eagles to Scotland. |
| Outer Islands | St Kilda | One of the most remote reserves in Britain, the islands support the largest gannet colony in the world and over a million seabirds in total. |
| Outer Islands | Rona and Sula Sgeir | The reserve contains approximately 130,000 seabirds during the breeding season, including storm-petrel, Leach's petrel, gannet and guillemot. Rona is also internationally important for its breeding grey seal population. |
| Argyll & Bute | Staffa | During spring and early summer, the cliffs and grassy slopes provide nesting sites for various seabirds including guillemots, razorbills and puffins. |
| North Channel | Caerlaverock | Barnacle geese, natterjack toads and saltmarsh. |

C5.2.4 Protected Species

Further to the designation of specific sites for conservation interests certain marine species have also been afforded protection. Under Annex IV of the Habitats Directive all cetacean species, marine turtles, otters and sturgeon have been identified as species of European Community interest and are afforded protection as European Protected Species (EPS). All EPSs are also fully protected under the Wildlife and Countryside Act 1981, but the Regulations provide a greater level of protection, primarily through licensing procedures. Additional protection is also afforded to European Protected Species under the Nature Conservation (Scotland) Act Schedule 6.

Other species that are not EPS, but are protected under Schedule 5 of the UK Wildlife and Countryside Act 1981 (as amended), include the following: the basking shark, allis shad, thwaite shad and other marine invertebrates.

C5.2.4.1

Mammals**Seals**

A number of national and international agreements and legislation provide the legal basis for the conservation and protection of seals around Scotland. Both grey and common seals are listed in Appendix 2 of the Convention on the Conservation of Migratory Species (Bonn Convention) which concludes multilateral Agreements for the conservation and management of migratory species.

The EU Habitats Directive (1992) lists both grey and common seals in Annex II and Annex V, and requires that Special Areas of Conservation (SAC) be established for their protection. SACs for grey and common seals in the study area are listed in Table C5.1.

The legislative provisions in the UK for the protection of wild animals are contained primarily in the Wildlife and Countryside Act, 1981, Sections 9-12. Specific legislation for seals is contained in Schedule 7 of this Act. Other specific legislation includes the Conservation of Seals Act 1970, and the Conservation of Seals (Scotland) Order 2002. These pieces of legislation prohibit certain methods of killing seals. Through section 10(3)(b) of the Conservation of Seals Act, Sites of Special Scientific Interest (SSSI) have been created that give a certain amount of protection to seals on land.

Cetaceans

In recent years, a number of international treaties and agreements have been established which provide a legal basis for the conservation and protection of cetaceans. Many of these are based on UK law but others are founded on European or International legislation.

The EU Habitats and Species Directive (1992) lists two species in Annex II, bottlenose dolphins and harbour porpoises, and requires that Special Areas of Conservation (SAC) be set up for them. A study into the relationship between bottlenose dolphins on the east, northern and western coasts of Scotland is currently underway by a research team from Aberdeen and St. Andrews University and Scottish Association for Marine Science (SAMS). The population biology and dispersed distribution of harbour porpoises makes choosing SACs for this species particularly difficult. Annex IV of the Directive includes all other cetacean species and requires member states to establish a system to monitor incidental capture and killing of cetaceans and to take measures to ensure that these activities do not have significant negative impacts on the species concerned.

Of the species regularly sighted in Scottish waters, common dolphins, bottlenose dolphins and harbour porpoises are listed in Appendix II of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) providing them with strict protection. All other cetaceans are listed in Appendix IV which allows exploitation so long as their population numbers are not put in danger. The Convention on the Conservation of Migratory Species (Bonn Convention) negotiated the establishment of ASCOBANS (the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas), which includes odontocete conservation in areas north and west of Scotland.

Other international agreements have been implemented. The International Convention for the Regulation of Whaling established the International Whaling Commission (IWC). The IWC primarily considers whaling issues but also has an interest in incidental takes of whales through ship or other collisions and entanglements, as well as the conservation status of small cetacean populations. Other, less species specific, conventions and agreements such as MARPOL (The International Convention for the Prevention of Pollution from Ships) and UNCLOS (United Nations Convention on the Law of the Sea) also apply.

It should be noted that some protections under the Wildlife and Countryside Act 1981 as amended by the Nature Conservation (Scotland) Act 2004 operate on the level of the individual marine mammal, rather than at a population level. Therefore, under the Wildlife and Countryside Act 1981 (as amended), deliberate disturbance and reckless disturbance of cetacea is an offence. It could be argued that lawful (i.e. consented) activities which incidentally give rise to disturbance could constitute deliberate or reckless disturbance, particularly if relevant mitigation measures have been disregarded.

Otters

Formerly widespread throughout the UK, the otter underwent a rapid decline in numbers from the 1950s to 1970s and was effectively lost from midland and south-eastern counties of England by the 1980s. Populations remain in Wales, south-west England and much of Scotland, where sea loch and coastal colonies comprise one of the largest populations in Europe. The decline now appears to have halted and sightings are being reported in former habitats.

The otter is listed on Appendix 1 of the Convention on the International Trade in Endangered Species of Flora and Fauna (CITES), Appendix II of the Bern Convention and Annexes II and IV of the Habitats Directive. It is protected under Schedule 5 of the WCA 1981 and Schedule 2 of the Conservation (Natural Habitats, etc.) Regulations, 1994 (Regulation 38). The European sub-species are also listed as globally threatened on the IUCN/WCMC Red Data List.

The EU Habitats Directive (1992) lists otters in Annex II and Annex V, and requires that Special Areas of Conservation (SAC) be established for their protection. There are a number of SAC sites in Scotland which list otters as their primary reason for selection. These are listed in Table C5.1: Special Areas of Conservation.

C5.2.4.2

Birds

There are a number of international treaties whose objectives are to encourage the conservation of birds through national action and international co-operation. The Conventions on Biodiversity (CBD), Migratory Species (CMS) (including daughter agreements on albatrosses & petrels (ACAP) and water birds (AEWA)), and Wetlands (Ramsar) are of particular importance for birds.

One of the most important instruments for bird conservation in the UK is the EC Directive on the Conservation of Wild Birds (Birds Directive), which lays out special measures to conserve wild birds, their eggs, nests and habitats. In particular, Article 4 of the Directive requires that Member States classify special protection areas (SPAs) for rare and vulnerable species (Annex I species) and for regularly occurring migratory species.

C5.2.4.3

Reptiles

Five species of marine turtle have been recorded in UK waters: leatherback turtle, loggerhead turtle, Kemp's Ridley turtle, green turtle and hawksbill turtle. However, there is some doubt as to whether reports of hawksbills can be confirmed.

Over the last 100 years there have been around 500 records of marine turtles from UK waters, particularly along the western coast, the large majority of those which can be identified being adult leatherbacks. The majority of these records are from the last 40 years and sightings are continuing to increase. In addition, large numbers of turtles are seen in waters above the shelf break in the Celtic Sea. Adult leatherbacks are regularly recorded in cool temperate waters around the world. They are endothermic and able to cope with cool water conditions, unlike the cheloniid or 'hard-shelled' species.

The conservation status of turtle species around the whole UK is unknown since they are a difficult group of animals to study. The numbers of reported sightings has gone up over recent years but this is likely to be a result of increased publicity and improved rates of record submission. They are all regarded as threatened at a global level. However, there are currently no sites designated for their protection in Scottish waters.

All five species are listed on Appendix I of the Convention on the International Trade in Endangered Species of Flora and Fauna (CITES) 1975, Appendix II of the Bern Convention 1979, Appendices I and II of the Bonn Convention 1979 and Annex IV of the EC Habitats Directive. The loggerhead is also listed as a priority species on Annex II of the EC Habitats Directive. All five species are protected under Schedule 5 of the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats & c.) Regulations 1994.

Although some species forage in temperate waters, nesting is restricted to beaches of tropical and subtropical waters. Some species of marine turtle have global distributions and their conservation has to be addressed at a global level.

C5.2.4.4 Fish and Shellfish

Of species regularly found within the study area, native oyster, basking shark and common skate are listed as UKBAP (UK Biodiversity Action Plan) species, and native oyster, common skate, cod and haddock are on the IUCN red list (IUCN, 2006). Horse Mussel beds are also listed as an Annex I habitat where they form biogenic reefs. The only marine species for which protected sites have been specifically designated are Sea Lamprey (*Petromyzon marinus*), River Lamprey (*Lampetra fluviatilis*), Allis Shad (*Alosa fallax*), and Atlantic Salmon. The only site within the study area identified as containing these species is the Solway Firth, which lists Sea Lamprey and River Lamprey as two of the primary reasons for designation of the site, and also contains Allis Shad. In the case of Atlantic Salmon the protected areas all refer to the freshwater stage of this species lifecycle, and so have not been included in the sensitivity mapping.

In addition to the species listed above, the following species, are protected under national, European or international legislation, Sturgeon (*Acipenser sturio*) and Thwaite shad. Although these have been recorded from west of Scotland or the Northern Isles, they are very rare in the study area, and have no areas designated for their protection in Scotland. They are therefore not considered further in this SEA. However, should these species be found in a proposed site for a specific marine energy development, impacts on them would, of course, need to be assessed in the project EIA.

C5.2.4.5 Benthic Species

Benthic habitats and species are protected under both UK and European legislation. The EU Habitats Directive lists marine and intertidal habitats of conservation importance (Annex I), and marine species of conservation importance (Annex II), and allows for the designation of Special Areas of Conservation (SACs). The UK has also identified a series of important benthic ecological sites under the Wildlife and Countryside Act 1981, under which Sites of Special Scientific Interest (SSSIs) are designated. Unlike SAC sites, SSSI sites are exclusively intertidal, extending only as far as Mean Low Water Springs.

The UK Biodiversity Action Plan (BAP) identifies important habitats and species and identifies means for protecting and improving their biodiversity, but does not designate specific sites for protection.

Whilst these initiatives combine to designate and protect important benthic and intertidal habitats in Scottish waters, the way in which habitat types have been defined differs for each designation type. Annex I habitats have a generally broad definition and may contain certain UKBAP habitats and SSSIs as sub-habitats, but there is not a direct relationship between the habitats identified. In addition, some UKBAP or SSSI habitats may occur in several Annex I Habitats. Table C6.1 in Chapter C6: Benthic Ecology lists UKBAP and Annex I habitats in the study area.

C5.2.4.6 The Scottish Biodiversity List

The Scottish Biodiversity Strategy, "Scotland's Biodiversity: It's in Your Hands" which aims to conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland now and in the future, was published by the Scottish Executive in May 2004. This strategy was developed in close partnership with the Scottish Biodiversity Forum, a broad based working partnership of public, private and voluntary organisations.

The Scottish Biodiversity List is a list of flora, fauna and habitats considered by the Scottish Ministers to be of principal importance for biodiversity conservation. The development of the list has been a collaborative effort involving a great many stakeholders overseen by scientists from the Scottish Biodiversity Forum. A list of marine species and habitats included in the Scottish Biodiversity List and therefore relevant to the SEA study area is included in Appendix C5.A.

C5.3 Effects

C5.3.1 Potential Key Effects and Sensitivity of Receptors

Potential effects on protected sites and species include the following:

- Impacts on the structure and function of the features of the site
- Impacts on site integrity
- Impacts on site quality
- Impacts on ecological coherence of the existing/proposed network of sites
- Impacts on protected species

The more specific nature and significance of impacts on protected sites and species will primarily be dependent on the interest features of the site in question, and potential key effects on these are assessed in the relevant chapters (C6: Benthic Ecology, C7: Fish and Shellfish, C8: Marine Birds and C9: Marine Mammals).

Where known, sensitivity of protected sites and species in the study area to the expected impacts of wave and tidal devices are included in the relevant chapters. Sensitivity has been estimated based on available knowledge.

C5.3.2 Potential Significance of Effects

The protected status of sites is taken into account for the assessment significance criteria in each of the relevant topic chapters. Sites and species protected under national and international legislation are considered to be of greater importance of sites and species that are not protected and therefore a greater significance has been attributed to potential effects on protected sites and species in each of the relevant chapters. Of particular importance is the Natura 2000 suite of sites (SACs and SPAs).

Under the EU Habitats Directive (European Commission Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) Member States are required to nominate sites to be designated as Special Areas of Conservation (SACs). Similarly under the Birds Directive (Council Directive 79/409/EEC) Member States are required to nominate sites as Special Protection Areas (SPAs) for the conservation of wild birds.

These sites are subject to the protection measures provided by the Directive to ensure that they will not be adversely affected by activities taking place. One key measure that relates to development in or close to SAC or SPA protected sites is the requirement for appropriate assessment. A competent authority, before deciding to undertake or give any consent, permission or other authorisation for, a plan or project which -

a) is likely to have a significant effect on a European site in Great Britain (either alone or in combination with other plans or projects), and

b) is not directly connected with or necessary to the management of the site, is required to make an Appropriate Assessment of the implications for the site in view of that site's conservation objectives (SNH, 2007). The need for "appropriate assessment" extends to plans or projects outwith the site boundary in order to determine their implications for the interest(s) protected within the site. Therefore, if a wave or tidal energy project sited outside of a Natura Site were to potentially have an adverse affect on the conservation objectives of a Natura Site an Appropriate Assessment would be required.

In the Waddenzee judgment (European Court of Justice, 2004), the European Court of Justice ruled that a plan or project may be authorised only if a competent authority has made certain that the plan or project will not adversely affect the integrity of the site. An appropriate assessment must be informed by the best scientific information and the competent authority must be certain that “no reasonable scientific doubt” remains that the conservation objectives of the site will be compromised (EJC, 2004). Competent national authorities must be “convinced” that there will not be an adverse affect and where doubt remains as to the absence of adverse effects, the plan or project must not be authorised, subject to the procedure outlined in Article 6(4) of the EC Habitats Directive regarding imperative reasons of overriding public interest. This is a significant issue for consenting of wave and tidal energy projects in or close to Natura 2000 sites, as in many cases, there is insufficient understanding of the processes involved to sufficiently inform the appropriate assessment process

The Habitats Directive introduces for the first time for protected areas, the precautionary principle; that is that projects can only be permitted having ascertained no adverse effect on the integrity of the site. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest. In such cases compensation measures will be necessary to ensure the overall integrity of network of sites (EJC, 2004).

Where a development would have adverse effects on Natura sites an Appropriate Assessment should be undertaken by the Competent Authority, which in the case of marine renewable energy development in Scotland is the regulator – the Scottish Executive. It should be noted that the qualifying species that define the designation may be mobile and may have an ecological reliance on areas outwith the Natura site boundary. For instance, breeding birds need to feed in the surrounding waters to maintain the breeding population. Potential effects on the qualifying species outwith the Natura site also need to be addressed in any Appropriate Assessment, as well as indirect and direct effects on sites themselves, to ensure the integrity of the Natura site is not adversely affected.

With regard to Appropriate Assessment of the subject of this SEA, it is considered that the policy under consideration does not constitute a plan or project and does not fall within the requirements of the Habitats Directive.

C5.4 Likelihood of Occurrence

Based on the information currently available to inform the assessment of impacts of marine renewable energy development, in general, the likelihood of occurrence of such impacts is difficult to determine, but the likelihood of specific effects on protected sites and species are included in the relevant SEA chapters.

C5.5 Mitigation Measures

Relevant mitigation measures for protected species and interest features of protected sites are included in each of the relevant topic chapters, and they will strongly depend on the interest features of the site in question. In the case of protected sites a key mitigation measure is likely to be the avoidance of protected sites for construction of devices and cables, and operation of devices. Should it not be possible to avoid a protected site this does not preclude marine or tidal energy development, the developer would, however, need to demonstrate that the development does not significantly impact the interest features of the site. This would be dependent on the nature of the site, the development and employment of appropriate mitigation measures. For example, cable installation disturbance impacts on breeding bird or seal colonies could be mitigated by undertaking installation activities outside of the breeding season.

C5.6 Confidence and Knowledge Gaps

Baseline conditions in protected sites such as Natura 2000 sites and SSSIs are generally well understood as these sites have been identified for their known habitats and populations of protected species and continue to be studied to ensure that the structure and function of the site features are maintained. Baseline conditions of future sites such as potential Annex I Habitat sites which may be designated in the offshore part of the study area are not well understood and this is a data gap that would need to be filled prior to development of specific wave or tidal arrays. A potential developer would need to be able to demonstrate that their development does not compromise the interest features of an existing or potential future Natura 2000 site.

Baseline distribution of protected mobile species is not so well understood. For example, as discussed in Chapter C9, there is limited information to inform the distribution of marine mammals in the study area. Distribution of birds at sea is also an important knowledge gap.

Potential interactions of devices with protected species is also a key knowledge gap, as identified in Chapters C6, C7, C8 and C9. Operational effects of marine renewable devices in terms of potential collision risk, noise disturbance impacts, effects of removal of energy from the hydrodynamic environment and effects on hydrodynamic, sediment and coastal processes, zones of influence of potential effects are all areas where further understanding is required. Potential to fill these gaps in knowledge are detailed in the relevant SEA chapters, but primarily relate to targeted modelling studies, and careful monitoring of future test and commercial projects.

C5.7 Recommendations for Survey and Monitoring

Recommendations for further survey and monitoring work in respect of the key features and species that are protected in the study area are given in the relevant SEA Level 1 Assessment chapters. It is also worth noting here that, as discussed in section 5.3.2, there is a higher burden of evidence associated with development that could affect the interest features of Natura 2000 sites. The Habitats Directive introduces for the first time for protected areas, the precautionary principle; that is that projects can only be permitted having ascertained beyond reasonable doubt that the development will have no adverse effect on the integrity of the site.

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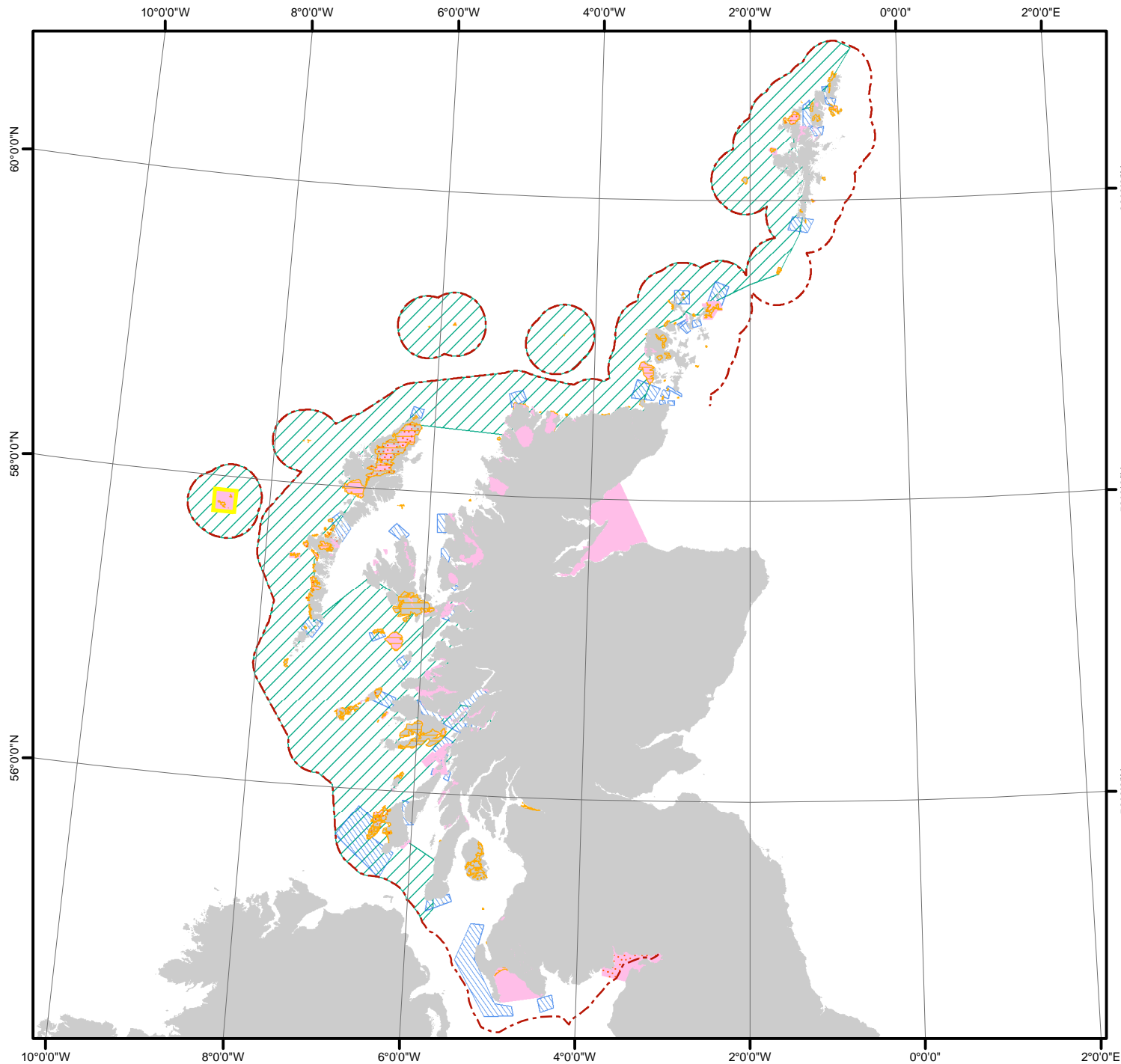
http://gateway.snh.gov.uk/portal/page?_pageid=53.854538&_dad=portal&_schema=PORTAL [Website Accessed June 2006]

Source: Ramsar Convention. <http://www.ramsar.org> [website accessed 16th February 2007]

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Figures


Figure C5.1: International protected sites in the study area - SACs, SPAs and Ramsar sites





Legend

Potential development area

 Tidal resource


 Wave resource

 12 Nautical mile limit (study area only)

 World Heritage Site

 Ramsar sites

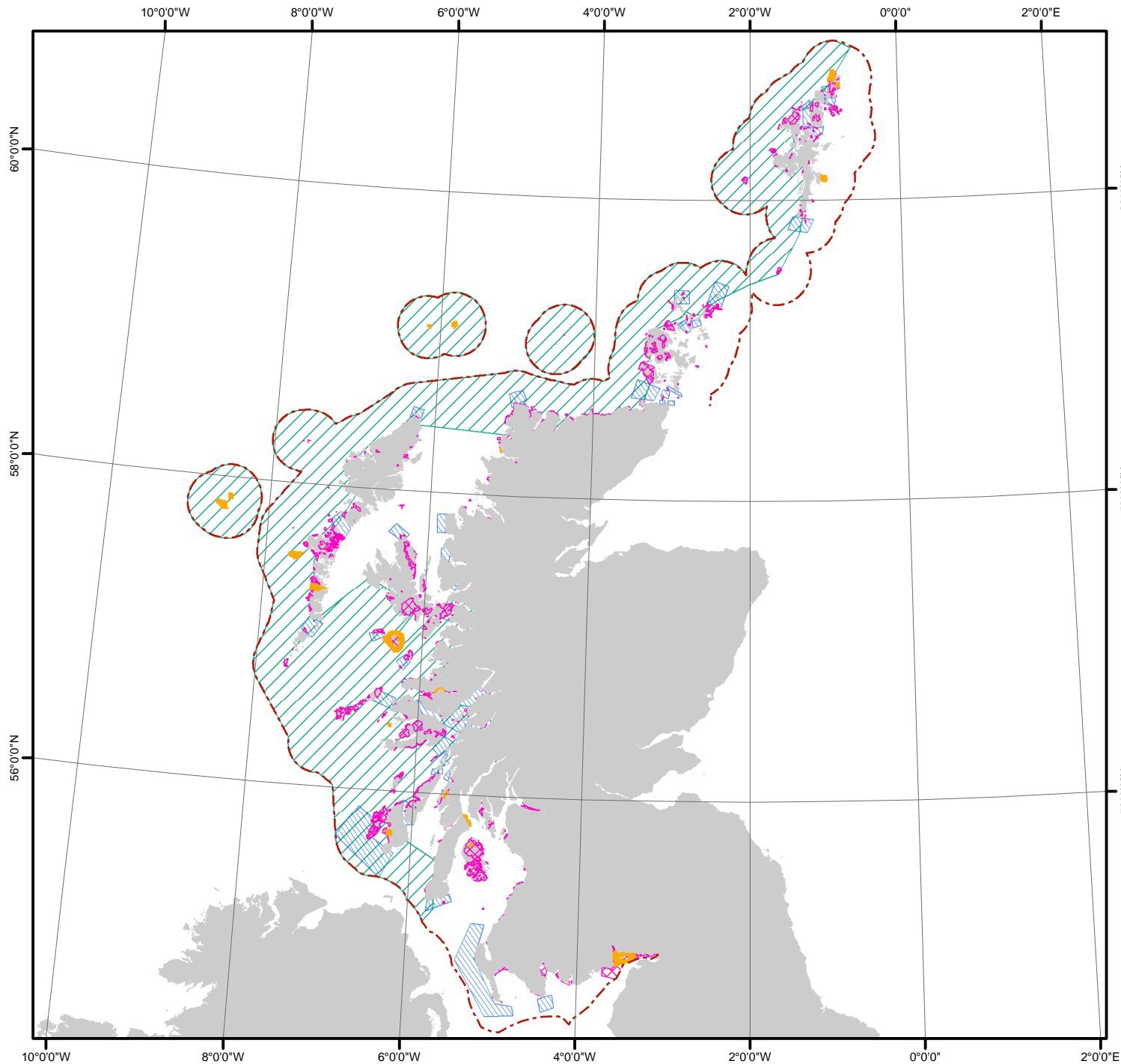
 Special Protection Areas

 Special Areas of Conservation

 Land

| | | |
|----------------|--|-----------------|
| Date | 19th February 2007 | |
| Projection | Transverse Mercator | |
| Spheroid | Airy | |
| Datum | OSGB36 | |
| Data Source | SeaZone Solutions Ltd; JNCC, Ramsar Convention | |
| File Reference | P736\GIS\Mxd\SEA\Baseline maps | |
| Checked | SH | GIS Specialist |
| | FLB | Project Manager |

Figure C5.2: National protected sites in the study area - SSSIs and NNRs



Legend

- Land
- 12 Nautical mile limit (study area only)

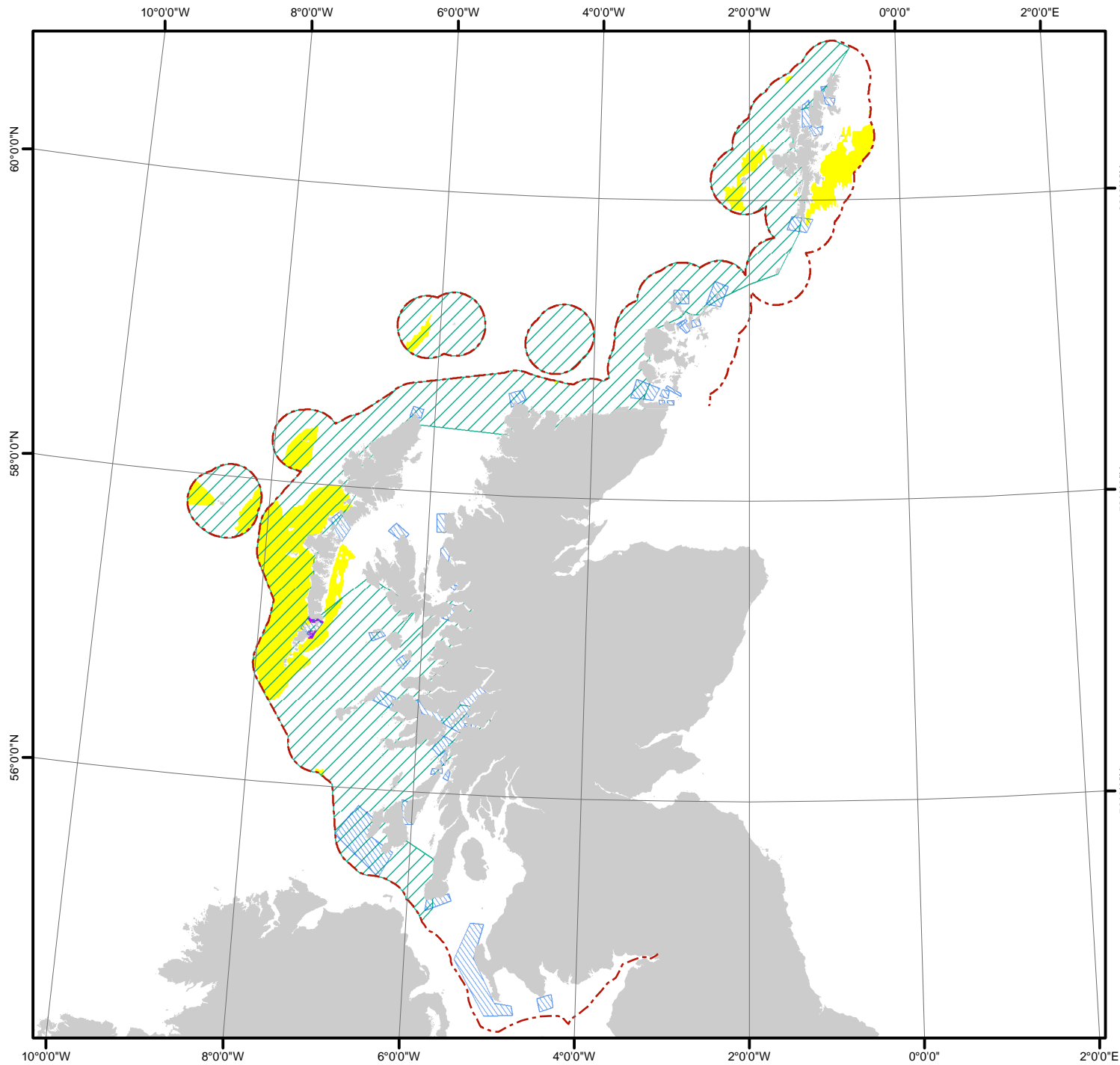
- Potential development area
- Tidal resource
- Wave resource

- SSSI
- NNR

| | | |
|----------------|--------------------------------|-----------------|
| Date | 19th February 2007 | |
| Projection | Transverse Mercator | |
| Spheroid | Airy | |
| Datum | OSGB36 | |
| Data Source | SeaZone Solutions Ltd; SNH | |
| File Reference | P736\GIS\Mxd\SEA\Baseline maps | |
| Checked | SH | GIS Specialist |
| | FLB | Project Manager |

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Figure C5.3: Potential Annex I Habitat sites, and proposed SAC sites



Legend

- Land
- 12 Nautical mile limit (study area only)

- Potential development area**
- Tidal resource
- Wave resource

- Proposed SAC
- Potential Annex I Habitat Site

| | | |
|----------------|--|-----------------|
| Date | 19th February 2007 | |
| Projection | Transverse Mercator | |
| Spheroid | Airy | |
| Datum | OSGB36 | |
| Data Source | SeaZone Solutions Ltd; JNCC, Ramsar Convention | |
| File Reference | P736\GIS\Mxd\SEA\Baseline maps | |
| Checked | SH | GIS Specialist |
| | FLB | Project Manager |