SEA of Marine Proposed Special Protection Areas

Strategic Environmental Assessment
Environmental Report

August 2018

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For:

Scottish Government
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marinescotland

Non-Technical Summary

Introduction

Marine Scotland is committed to a clean, healthy, safe, productive and biologically diverse marine and coastal environment that meets the long term needs of people and nature. This includes the classification and management of marine protected areas, including Special Protection Areas (SPAs) to protect birds.

SPAs are classified under the EU Birds Directive 2009/147/EC which seeks to safeguard the habitats of the bird species for which they are selected and to protect the birds from significant disturbance.

In the Scottish marine environment 31 SPAs were created in 2009 by protecting waters immediately adjacent to the most important seabird breeding colonies on land. Public consultation was undertaken in 2016 on 15 proposed marine SPAs (pSPAs)[1] (Figure NTS1). As part of the process to determine whether the 15 proposed SPA should be classified, we now invite views on both the findings of the SEA and the Network Assessment that accompanies this consultation.

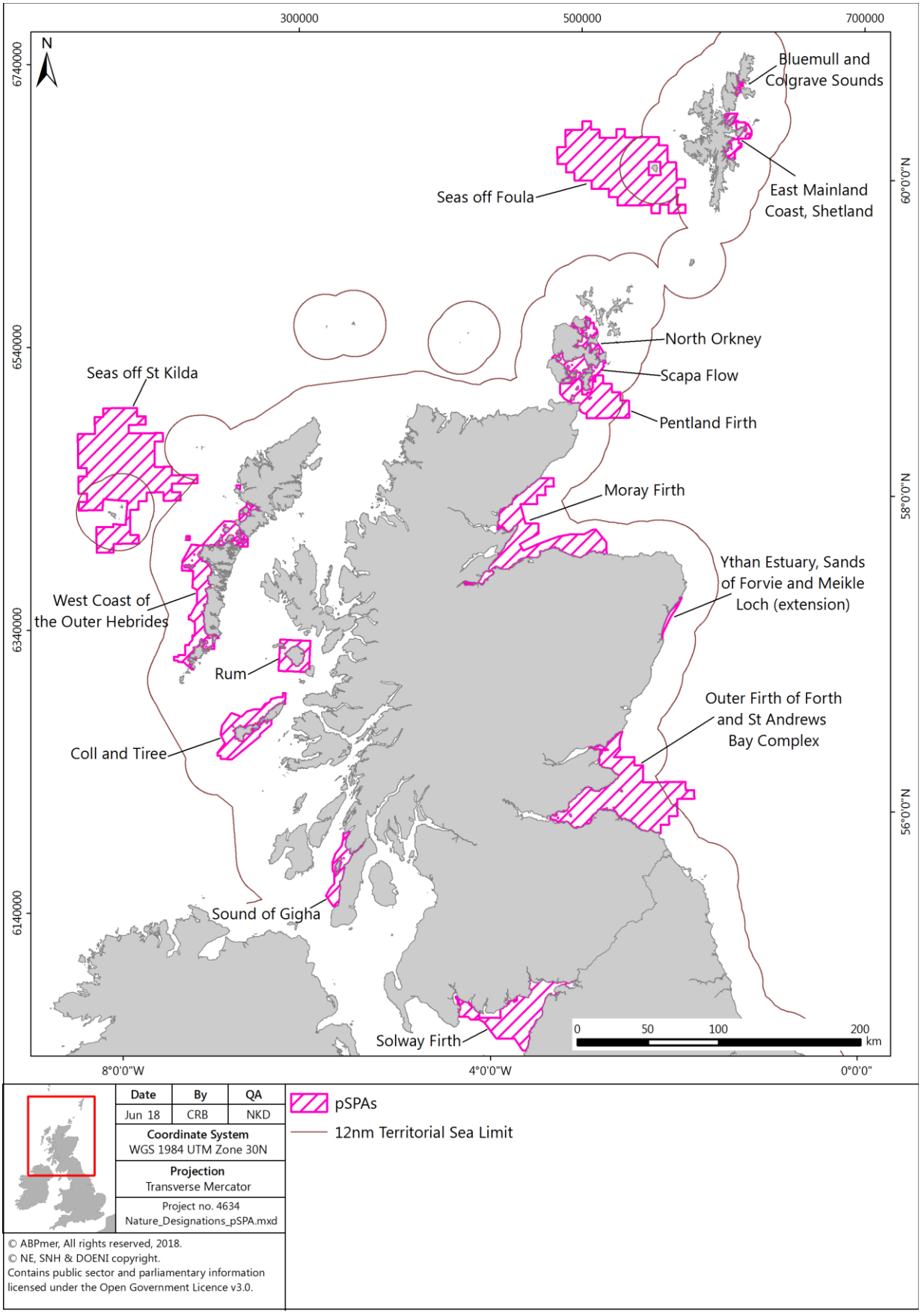
What is Strategic Environmental Assessment?

The Environmental Assessment (Scotland) Act 2005 ('the 2005 Act') requires that certain public plans, programmes and strategies be assessed for their potential effects on the environment. Strategic Environmental Assessment (SEA) is the process used to fulfil this requirement, and includes consultation with the public and the Consultation Authorities (Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH), and Historic Environment Scotland (HES)).

SEA identifies the likely significant environmental impacts of plans and policies, and alternatives to them. SEA also identifies mitigation measures that are required to avoid or minimise any significant adverse effects and highlights opportunities for enhancements of beneficial effects. Taking place at an early stage in the plan or policy development process, it ensures that decision-making is informed by relevant environmental information. SEA provides opportunities for the public to consider this information and use it to inform their views on the draft plan or policy.

[1] The Scottish Government (2016). 2016 Consultation on Marine SPAs. Available at: https://www.gov.scot/Topics/marine/marine-environment/mpanetwork/marinespas (accessed 23/07/2018).

Figure NTS1 Marine Proposed Special Protection Areas



A screening and scoping exercise on the classification of the pSPAs was undertaken by Marine Scotland, in accordance with the requirements of the 2005 Act. In response to the screening, Consultation Authorities confirmed the need for a SEA due to the potential for significant environmental effects to occur. They also provided comment on the proposed scope and methodology of the assessment and the proposed consultation period for the Environmental Report. Their views were taken into account when preparing this Environmental Report, as per the requirements of the 2005 Act.

This report summarises the findings of the SEA that has been undertaken on the classification of the pSPAs.

What are the pSPAs?

SPAs are classified under EU Directive 2009/147/EC, the 'Birds Directive', which seeks to conserve all wild birds in the EU by setting out rules for their protection and management. Each Member State has a duty under Article 4 of the Birds Directive to classify SPAs for species listed in Annex I that occur within their territory, as well as for regularly occurring migratory birds.

The classification of the pSPAs is considered necessary by SNH and the Joint Nature Conservation Committee (JNCC) to meet the obligations of the Birds Directive. As part of this process, SNH and JNCC have identified features which they consider essential for protection in each site. In some cases, the pSPAs are entirely new, while others are an extension of existing SPAs to include additional species and/or habitats.

The pSPAs have been selected in accordance with the 'UK SPA Selection Guidelines'[2]. These cover a range of species which use Scottish Waters:

- Inshore wintering waterfowl;
- Foraging areas for breeding terns;
- Foraging areas for breeding red-throated divers;
- Important areas for European shag; and
- Aggregations of seabirds.

SPAs that are classified need to be managed to meet their conservation objectives. There are specific obligations for authorities to consider when making decisions to permit activities and development. In some cases specific management measures may be required. In 2016, management advice for each pSPA was developed and presented in the "Advice to Support Management" documents. The recommended options for potentially managing the pSPAs are summarised in Table NTS1.

[2] JNCC (1999) SPA selection guidelines [online] Available at: http://jncc.defra.gov.uk/page-1405 (accessed 24/01/2018)

Table NTS1 Possible management advice options that may be applied at sites

- Reduce or limit entanglement pressures associated with new finfish farms or undeveloped finfish farm consents as well as the expansion or relocation of existing fish farms through application of best practice;
- Reduce or limit pressures associated with the use of anti-predator netting at shellfish farms within the pSPA by following best practice;
- Reduce or limit pressures associated with disturbance by maintenance vessels and predator deterrents;
- Remove or avoid pressures associated with fishing/trawling for sandeels;
- Remove or avoid pressures associated with fishing/benthic dredging that have the potential to damage sandeel habitat;
- Prohibit the use of fixed bottom set nets and fyke nets in areas identified as being important for certain qualifying features (seasonal restriction);
- Prohibit the use of drift nets in areas identified as being important for certain qualifying features (seasonal restriction);
- Prohibit the use of all set (gill) nets in areas identified as being important for certain qualifying features (seasonal restriction);
- Prohibit the use of set nets at finfish farms for recapture of escaped farmed stock within the pSPA (seasonal restriction);
- Reduce the pressures associated with new ship to ship transfers in the pSPA;
- Remove, avoid or reduce/limit collision pressures associated with offshore and/or marine renewables for qualifying features; and
- Remove or avoid displacement pressures associated with offshore and/or marine renewables in areas identified as being important for certain qualifying features.

How was the Strategic Environmental Assessment undertaken?

A high-level and qualitative assessment has been undertaken. The environmental changes that are likely to result from the classification of pSPAs and associated management of licensed activities have been assessed. In addition, the changes that may result from the possible future implementation of the recommended options for managing non-licensable activities (i.e. fishing) within the pSPAs have also been assessed (see Table NTS1). Any specific management measures that are subsequently required to meet the objectives of the pSPAs will be subject to further consideration under the 2005 Act.

The assessment has identified the individual and collective effects of the classification and management of pSPAs on a number of SEA topics, specifically marine biodiversity, flora and fauna; soil; water; and climatic factors. In order to recognise the interlinkages between these SEA topics, these have been collectively considered under the overarching topic ‘biodiversity, flora and fauna’. The assessment has also considered the potential implications of the classification and management of sites in relation to a series of key questions (‘SEA objectives’). Information about the existing marine environment has been used to inform the assessment and define the SEA objectives.

Social and economic effects, including those on other users of the marine environment, have been previously assessed in a Socio-Economic Impact Assessment (SEIA) which is reported on separately[3].

Which reasonable alternatives have been assessed?

Three alternative scenarios (high, medium and low) have been assessed. These are based on varying the inclusion of species as qualifying features for each pSPA. The status quo (i.e. not classifying the pSPAs) is not a reasonable alternative as the classification of these sites is considered necessary to meet the obligations of the Birds Directive.

What is the current state of the environment?

Scotland's marine environment supports a diverse complex of different habitats, which in turn support a wide range of marine plants and animals. Scotland, and its coastline, is important for marine and coastal birds, including seabirds, seaducks, divers, grebes, waders and waterfowl. Scotland provides an essential feeding station for migrating birds, a safe winter haven for ducks, geese and shorebirds, and provides nesting sites for seabird species. A total of 41 bird species have been identified as qualifying features within the pSPA, and 11 of these species are specified under Annex I of the Birds Directive, indicating they are in danger of extinction, vulnerable to specific changes in their habitat, considered rare because of small populations or restricted local distribution; or requiring particular attention for reasons of the specific nature of habitat[4].

Scotland's marine biodiversity is protected by a range of European and national designations. Key habitat types include: estuaries; lagoons; large shallow inlets and bays; mudflats and sandflats not covered by seawater at low tide; reefs; sandbanks which are slightly covered by seawater all the time; submarine structures made by leaking gases; and submerged or partially submerged sea caves. Key animal species include cetaceans (dolphins and porpoises), seals, birds, fish (including sea lamprey and Atlantic salmon) and otters. The current health and condition of a number of habitats and species has been declining[5]. Existing and future pressures on marine biodiversity, flora and fauna are mainly from commercial fishing, non-native invasive species, marine litter, navigational dredging, marine transport, aquaculture, recreation, offshore renewable developments and climate change[6].

[3] The Scottish MPA Project: Second Iteration of Site Proposals – Developing the Evidence Base for Impact Assessments, ABPmer

[4] European Commission, Bird species of Annex I of the Birds Directive [Online] Available at http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm, accessed 31/07/2018.

[5] Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

[6] The Scottish Government (2013) FEAST – Feature Activity Sensitivity Tool. [online] Available at: http://www.marine.scotland.gov.uk/feast/ (accessed 02/05/18)

Scotland's Marine Atlas reported that seabird populations are increasing in some areas (Solway Firth and the Firth of Clyde, for example) and decreasing in others for certain species. In East and West Shetland and along the North Scotland coast, this decrease is most probably related to a shortage of prey species resulting from changes in oceanographic conditions. Waterbirds (wildfowl and waders) are also both increasing and decreasing year on year, depending on the species and location[7]. The reasons for declines remain to be fully explained but may in part be due to redistribution of wintering birds across northwest Europe due to climate change effects.

Scotland has a wide range of geological (rocks, minerals, fossils and structures), geomorphological (landforms and processes) and soil features that make up the marine and coastal landscape. Key protected features include: Quaternary of Scotland; submarine mass movement; marine geomorphology of the Scottish deep ocean seabed; seabed fluid and gas seep; Cenozoic structures of the Atlantic margin; and marine geomorphology of the Scottish shelf seabed. The condition of these features influences the quality of habitats and in turn the viability and health of both flora and fauna populations[8].

Scotland's seas are mostly classed as being of high or good ecological status under the Water Framework Directive. There is a small area in the Firth of Forth that is classified as poor. The key pressures to the quality of the water environment are from man-made barriers to fish migration, modifications to physical condition, rural diffuse pollution, waste water discharges and hydroelectricity generation[9].

Within Scottish seas and coastal areas, multiple habitats are present that can be termed 'blue carbon sinks' due to their ability to convert carbon dioxide to solid carbon in living material and incorporate or store this carbon into biomass. These include: kelp forests, saltmarshes, seagrass beds, maerl beds and biogenic reefs[10]. Their effectiveness as carbon sinks is highly dependent upon their long term capacity to store carbon. Climate change has the potential to affect the carbon regulating capacity of marine habitats.

[7] Teresa M. Frost, Graham E. Austin, Neil A. Calbrade, Heidi J. Mellan, Richard D. Hearn, David A. Stroud, Simon R. Wotton and Dawn E. Balmer (2018).Waterbirds in the UK 2016/17: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford.

[8] SNH (2013) Assessing the sensitivity of geodiversity features in Scotland's seas to pressures associated with human activities. Report 590. Available at: http://www.snh.org.uk/pdfs/publications/commissioned_reports/590.pdf

[9] Scottish Government (2015) The river basin management plan for the Scotland river basin district: 2015–2027. https://www.sepa.org.uk/media/163445/the-river-basin-management-plan-for-the-scotland-river-basin-district-2015-2027.pdf (accessed 02/02/2018).

[10] Burrows, M.T., Hughes, D.J., Austin, W.E.N., Smeaton, C., Hicks, N., Howe, J.A., Allen, C., Taylor, P. & Vare, L.L. (2017) Assessment of Blue Carbon Resources in Scotland's Inshore Marine Protected Area Network. Scottish Natural Heritage Commissioned Report No. 957.

What are the likely significant environmental effects of the pSPAs?

The key potential environmental effects that could arise from the classification of the pSPAs are as follows:

- Potential benefits to qualifying features in pSPAs by minimising or avoiding specific activities and pressures that currently or might in the future occur within these sites;
- Potential spillover benefits beyond pSPA site boundaries;
- Potential adverse environmental effects on areas outwith the pSPAs resulting from the displacement of activities and the intensification of activities in areas where they already occur; and
- Potential environmental impact of increased levels of activity that might not be targeted by the recommended management advice for pSPAs.

Overall, the increased protection that will result from the classification of the pSPAs will provide environmental benefits for the overarching topic 'biodiversity, flora and fauna' and all of the topics that have been scoped in under this heading (i.e. biodiversity, flora, and fauna; soil; water, and climatic factors) and contribute to the achievement of the SEA objectives. This is because the classification of the sites will provide greater clarity and confidence to developers providing evidence in support of assessments under the Habitats Regulations. Increasing the assessment requirements and consideration of appropriate mitigation may also result in developers looking to site their projects outside of the boundaries of pSPAs, though this would be a decision by developers as opposed to recommendations from regulators. This in turn would result in reduced harmful activities and potential environmental benefits within these sites.

The manner in which fishing activities within the sites are managed in the future to ensure that the conservation objectives for the qualifying features are achieved also has the potential to result in significant environmental changes. However, the range and scale of management measures for fishing activities that might be implemented are not currently known and therefore it is not possible to assess the significance of any environmental changes with any level of certainty.

What are the cumulative effects of the pSPAs?

There will be beneficial cumulative effects from the classification and management of all the pSPAs as a greater proportion of birds will be protected across their range which in turn will provide greater resilience to human pressures. There may also be significant cumulative benefits for overwintering birds and inshore assemblages that move between SPAs as the pSPAs have the potential to improve the potential connectivity between protected areas for these features[11,12,13]. The potential cumulative benefits of

[11] Mazaris AD, Papanikolaou AD, Barbet-Massin M, Kallimanis AS, Jiguet F, Schmeller DS, et al. (2013) Evaluating the Connectivity of a Protected Areas' Network under the Prism of Global Change: The Efficiency of the European

improving connectivity for seabird foraging features will be more marginal given the high level of fidelity for individual seabird foraging areas and their breeding colonies. There is also the potential for the classification and management of pSPAs to improve the connectivity of habitats across protected sites through the larval dispersal of benthic species[14,15].

There is potential for activities currently occurring in the pSPAs to be displaced to other areas, where such activities are not specifically managed. This could lead to negative environmental effects on these areas. For regulated activities, such as renewable energy or aquaculture developments, environmental assessments would be required before an activity could take place, thus limiting the potential for significant cumulative adverse effects to occur.

How do I respond to the consultation?

The consultation on the Environmental Report is now open, along with the accompanying SPA network Assessment. Views and opinions on this are now invited and should be provided by midnight 9th November 2018.

Please respond to the consultation online at: www.scotland.gov.uk/consultations

Or using the direct link: https://consult.gov.scot/marine-scotland/sea-for-15-proposed-special-protection-areas

Should you require to refer to the original consultation for reference, please see the below links:

http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/marinespas - General policy and Business and Regulatory Impact Assessments

https://www.nature.scot/2016-17-marine-bird-proposed-special-protection-areas-consultation-pspas-consultation-closed - SNH/Nature Scotland inshore pSPAs

http://jncc.defra.gov.uk/page-4563 - Seas off St Kilda pSPA

http://jncc.defra.gov.uk/page-4564 - Seas off Foula pSPA

Natura 2000 Network for Four Birds of Prey. PLoS ONE 8(3): e59640. https://doi.org/10.1371/journal.pone.0059640, accessed 22/08/2018.

[12] Crooks KR, Sanjayan M (2006) Connectivity Conservation. Cambridge, UK: Cambridge University Press. 726 p.

[13] Heller NE, Zavaleta ES (2009) Biodiversity management in the face of climate change: A review of 22 years of recommendations. Biological Conservation 142: 14–32.

[14] Planes, S., Jones, G. P. and Thorrold S. R. (2009) Larval dispersal connects fish populations in a network of marine protected areas. Proceedings of the National Academy of Sciences USA, 2009

[15] Anadon, J. D., M. M. Mancha-Cisneros, B. D. Best, and L. R. Gerber (2013) Habitat-specific larval dispersal and marine connectivity: implications for spatial conservation planning. Ecosphere 4(7):82. http://dx.doi.org/10.1890/ES13-00119.1, accessed 22/08/2018.

Copies of the consultation documents and the Environmental Report are available for viewing during office hours at the Scottish Government library at Saughton House, Edinburgh (K Spur, Saughton House, Broomhouse Drive, Edinburgh, EH11 3XD).

If you have any inquiries or difficulties accessing this please contact:
Marine_Conservation@scotland.gsi.gov.uk

Or send your inquiry by post to:

pSPA Consultation
Scottish Government
Marine Planning and Policy Division
Area 1-A South
Victoria Quay
Edinburgh EH6 6QQ

What happens next?

Following the consultation period, the responses received will be analysed, and a Post-Adoption Statement will be prepared. The Post-Adoption Statement will explain how issues raised in the SEA, and associated views in response to the consultation, have been addressed.

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1 Introduction

1.1 Background

1.1.1 Marine Scotland is committed to a clean, healthy, safe, productive and biologically diverse marine and coastal environment that meets the long term needs of people and nature. The classification and management of a number of new nature conservation sites, including Special Protection Areas (SPAs), will make a significant contribution to the protection, enhancement and health of the marine area[16].

1.1.2 SPAs are classified under the EU Birds Directive 2009/147/EC[17]. The Directive requires Member States to identify and classify the most suitable territories, in size and number, for certain rare or vulnerable bird species and for regularly occurring migratory bird species[18].

1.1.3 Scotland currently has 45 existing marine SPAs, of which 31 are extensions to seabird colony SPAs. Previous consultation exercises were undertaken in 2016 on a proposed suite of 15 marine SPAs in UK Waters[19].

1.1.4 Building on the work of the SPA Review Working Group and taking account of existing guidelines on the identification of SPAs[20], Scottish Natural Heritage (SNH), the Joint Nature Conservation Committee (JNCC) and Natural England identified 15 sites which they consider essential for marine SPA status. These proposals include sites supporting wintering waterfowl, seabird aggregations, important areas for foraging breeding red-throated divers, breeding terns, and breeding and non-breeding European shag. The classification of these pSPAs in UK waters is the subject of this Environmental Report, produced as part of a Strategic Environmental Assessment (SEA).

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[16] Scottish Government (2015) Scotland's National Marine Plan. Available at: http://www.gov.scot/Resource/0047/00475466.pdf (accessed 11/06/2018)

[17] European Commission (2009) Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version) [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147 (accessed 22/01/2018)

[18] Scottish Government (2017) Marine Protected Areas (MPAs) - Marine SPAs [online] Available at: http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/marinespas (accessed 14/11/2017)

[19] The Scottish Government (2016) 2016 Consultation on Marine SPAs. Available at: https://www.gov.scot/Topics/marine/marine-environment/mpanetwork/marinespas (accessed 23/07/2018).

[20] JNCC, undated. UK SPA selection guidelines [online] Available at: http://jncc.defra.gov.uk /page-1405 (accessed 10/05/2018)

1.2 Strategic Environmental Assessment

1.2.1 The Environmental Assessment (Scotland) Act 2005 ('the 2005 Act') requires that certain public plans, programmes and strategies be assessed for their potential effects on the environment[21]. Strategic Environmental Assessment (SEA) is the process used to fulfil this requirement, and includes consultation with both the public and the Consultation Authorities[22]. The Act also sets out the information that is required to be provided in this Environmental Report.

1.2.2 A screening and scoping exercise on the classification of marine pSPAs was undertaken by Marine Scotland, in accordance with the requirements of the 2005 Act. A combined Screening and Scoping Report was published in March 2018, setting out the proposed approach to the SEA, including the proposed scope and level of detail. Comments were invited from the Scottish Consultation Authorities.

1.2.3 The outcome of the screening exercise and the consultation responses confirmed the need for an SEA due to the likelihood for significant environmental effects to arise. The proposed scope of the assessment and methodology was broadly accepted by the Scottish Consultation Authorities (see Section 3).

1.2.4 There is potential for cross-border impacts to arise from the classification of the pSPAs. As such, this SEA has been undertaken in accordance with both the requirements of the 2005 Act and the Environmental Assessment of Plans and Programmes Regulations 2004[23] (the '2004 Regulations').

1.2.5 Marine Scotland commissioned ABP Marine Environmental Research Ltd. (ABPmer) to undertake the assessment stage of the SEA and prepare this Environmental Report.

1.3 Purpose and structure of this report

1.3.1 The purpose of this Environmental Report is to document the findings of the SEA on the classification of the pSPAs. Views are now being sought from the public, the Scottish

[21] Scottish Government (2005) Environmental Assessment (Scotland) Act 2005, asp 15 [online] Available at: https://www.legislation.gov.uk/asp/2005/15/introduction (accessed 10/05/2018)

[22] Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Environment Scotland (HES).

[23] The Environmental Assessment of Plans and Programmes Regulations 2004, SI 2004/1663 [online] Available at: http://www.legislation.gov.uk/uksi/2004/1633/introduction/made (accessed 29/11/2017)

Consultation Authorities and the UK consultation bodies[24] (Historic England, Natural England, and the Environment Agency).

1.3.2 The remainder of this Environmental Report is structured as follows:

- Section 2 provides information on the proposed classification of the pSPAs;
- Section 3 presents the approach to the SEA, including the methodology used;
- Section 4 describes the relevant components of the environment that could be affected by the classification of the pSPAs;
- Section 5 sets out the results of the assessment; and
- Section 6 considers the next steps in both the classification of the pSPAs as well as the SEA process.

1.3.3 The Non-Technical Summary precedes Section 1.

[24] UK Government (2015) Guidance - Strategic environmental assessment and sustainability appraisal [online] Available at: https://www.gov.uk/guidance/strategic-environmental-assessment-and-sustainability-appraisal (accessed 29/11/2017)

2 Special Protection Areas

2.1 Background

2.1.1 SPAs are classified under the EU Directive 2009/147/EC[25], the 'Birds Directive'. The Birds Directive seeks to conserve all wild birds in the EU by setting out rules for their protection and management[26].

2.1.2 Each Member State has a duty under Article 4 of the Birds Directive to classify SPAs for species listed in Annex I that occur within their territory, as well as for regularly occurring migratory birds[27]. SPAs, along with Special Areas of Conservation (SACs)[28] are components of the Natura 2000 network that form a unified, multinational system of protected sites to support rare and endangered European habitats and species[29]. Marine SPAs and SACs are also referred to as European Marine Sites[30].

2.1.3 The protection of SPAs and SACs is provided for by the Habitats Directive. The Habitats Directive is transposed into domestic law via the Habitats Regulations[31]. Marine SPAs and SACs are subject to special provisions for protecting and managing these marine areas, as outlined within Habitats Regulations 33 to 35[32].

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[25] European Commission (2009) Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version) [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147 (accessed 14/05/2018)

[26] European Commission (1979) Council Directive of 2 April 1979 on the conservation of wild birds [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Al28046 (accessed 14/05/2018)

[27] European Commission (2009) Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version) [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147 (accessed 14/05/2018)

[28] European Commission (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043 (accessed 14/05/2018)

[29] European Commission (2015) The EU's protected areas – Natura 2000 [online] Available at: http://ec.europa.eu/environment/basics/natural-capital/natura2000/index_en.htm (accessed 14/05/2018)

[30] SNH (2017) Marine Natura sites [online] Available at: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/international-designations/natura-sites/marine-natura-sites (accessed 14/05/2018)

[31] The Habitats Regulations comprise the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in 2012) in inshore waters in Scotland; the Offshore Marine Regulations 2017 in Scottish waters more than 12 nm from land; and the Conservation of Habitats and Species Regulations 2017 in inshore waters in England and Wales.

[32] SNH (2017) Marine Natura sites [online] Available at: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/international-designations/natura-sites/marine-natura-sites (accessed 14/05/2018)

2.1.4 Proposed activities that could affect an SPA are assessed for their potential to cause detrimental impact to the site, with the relevant competent authority tasked with preventing any adverse effects from occurring[33].

2.2 Existing SPAs

2.2.1 Scotland currently has 153 classified SPAs that cover over 1.23 million hectares (4,600 square miles) of land and inshore waters[34]. Of these, 45 are marine SPAs, of which 31 are extensions to seabird colony SPAs[35]. In addition to covering land and cliffs used by seabird colonies for breeding, the SPAs also protect adjacent marine waters that support a variety of activities such as feeding, loafing, preening, and display[36]. These SPAs extend out up to 4 km from shore.

2.3 Proposed Special Protection Areas

2.3.1 The classification of pSPAs is considered necessary by SNH and the JNCC to meet the obligations of the Birds Directive. As part of this process, SNH and JNCC have identified features which they consider essential for protection in each site. In some cases, the pSPAs are entirely new, while others are an extension of existing SPAs to include additional species and/or habitat.

2.3.2 Early advice from SNH and JNCC was submitted to Scottish Ministers in 2014. In addition, Marine Scotland held a stakeholder workshop in 2016[37] that resulted in the revision of some of the pSPA boundaries to achieve better alignment with modelled distributions of the bird species[38].

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33 Scottish Government (2016) Special Protection Areas in the Marine Environment Q&A [online] Available at: http://www.gov.scot/Resource/0050/00507009.pdf (accessed 14/05/2018)

34 SNH (2017) Special Protection Areas (SPAs) [online] Available at: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/international-designations/natura-sites/special-protection-areas-spas (accessed 14/05/2018)

35 SNH (2017) Marine Natura sites [online] Available at: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/international-designations/natura-sites/marine-natura-sites (accessed 14/05/2018)

36 ibid

37 Marine Scotland (2016) Selection of suitable sites for marine birds and advice on management in the Scottish Marine Protected Areas Network – Summary report of the marine Special Protection Area (SPA) stakeholder workshop [online] Available at: http://www.gov.scot/Resource/0050/00500837.pdf (accessed 14/05/2018)

38 SNH (2016) 2016-17 SPA Consultation Overview – Consultation on five additional proposals for Special Protection Areas in the seas around Scotland [online] Available at: https://www.nature.scot/sites/default/files/2017-10/2016%20Marine%20Bird%20SPA%20Consultation%20-

2.3.3 This led to a public consultation in 2016 on 15 pSPAs that continued into early 2017[39]. The consultation sought stakeholder views on:

- Support for enhancing Scotland's network of Marine Protected Areas (MPAs);
- The scientific case for classifying each individual proposed SPA;
- The proposed management advice for each of the sites; and
- The accompanying Business and Regulatory Impact Assessments (BRIAs), produced by Marine Scotland[40].

2.3.4 Of the 15 pSPAs that are being classified, 10 lie entirely within Scottish territorial waters (within 12 nm of the territorial limit). An additional four sites have offshore components and one (Solway Firth pSPA) has cross-border components with England. The location of the pSPAs is shown on Figure 1. Table 1 sets out the pSPAs, alongside their respective proposed qualifying features.

2.3.5 The pSPAs have been selected in accordance with the 'UK SPA Selection Guidelines'[41]: These cover a range of species which use Scottish Waters:

- Inshore wintering waterfowl;
- Foraging areas for breeding terns;
- Foraging areas for breeding red-throated divers;
- Important areas for European shag; and
- Aggregations of seabirds.

2.3.6 Preference was given to areas that simultaneously satisfy several protection objectives (that is, 'hotspots'), rather than focusing on those that are used by only one or a few species[42].

2.3.7 SPAs that are classified need to be managed to meet their conservation objectives. There are specific obligations for authorities to consider when making decisions to permit activities and development. In some cases specific

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%20Overview%20-%20Additional%20proposals%20including%20Solway%20%28A2110706%29.pdf (accessed 14/05/2018)

39 Scottish Government (2016) Special Protection Areas in the Marine Environment Q&A [online] Available at: http://www.gov.scot/Resource/0050/00507009.pdf (accessed 14/05/2018)

40 ibid

41 JNCC (1999) SPA selection guidelines [online] Available at: http://jncc.defra.gov.uk/page-1405 (accessed 24/01/2018)

42 Scottish Government (2016) Special Protection Areas in the Marine Environment Q&A [online] Available at: http://www.gov.scot/Resource/0050/00507009.pdf (accessed 14/05/2018)

management measures may be required. In 2016, management advice for each pSPA was developed and presented in the “Advice to Support Management” documents. The recommended options for potentially managing the pSPAs[43] are summarised in Table 2. Further management recommendations in these documents will be addressed through existing consenting processes and are not considered further in this SEA.

[43] Scottish Government, Management Options Papers for SPA sites, SPA Workshop 2016 - Supplementary Documents [online] Available at https://www.gov.scot/Topics/marine/marine-environment/mpanetwork/marinespas/spaworkshop/spaworlshopdocuments (accessed 01/08/2018)

Figure 1 Marine pSPAs

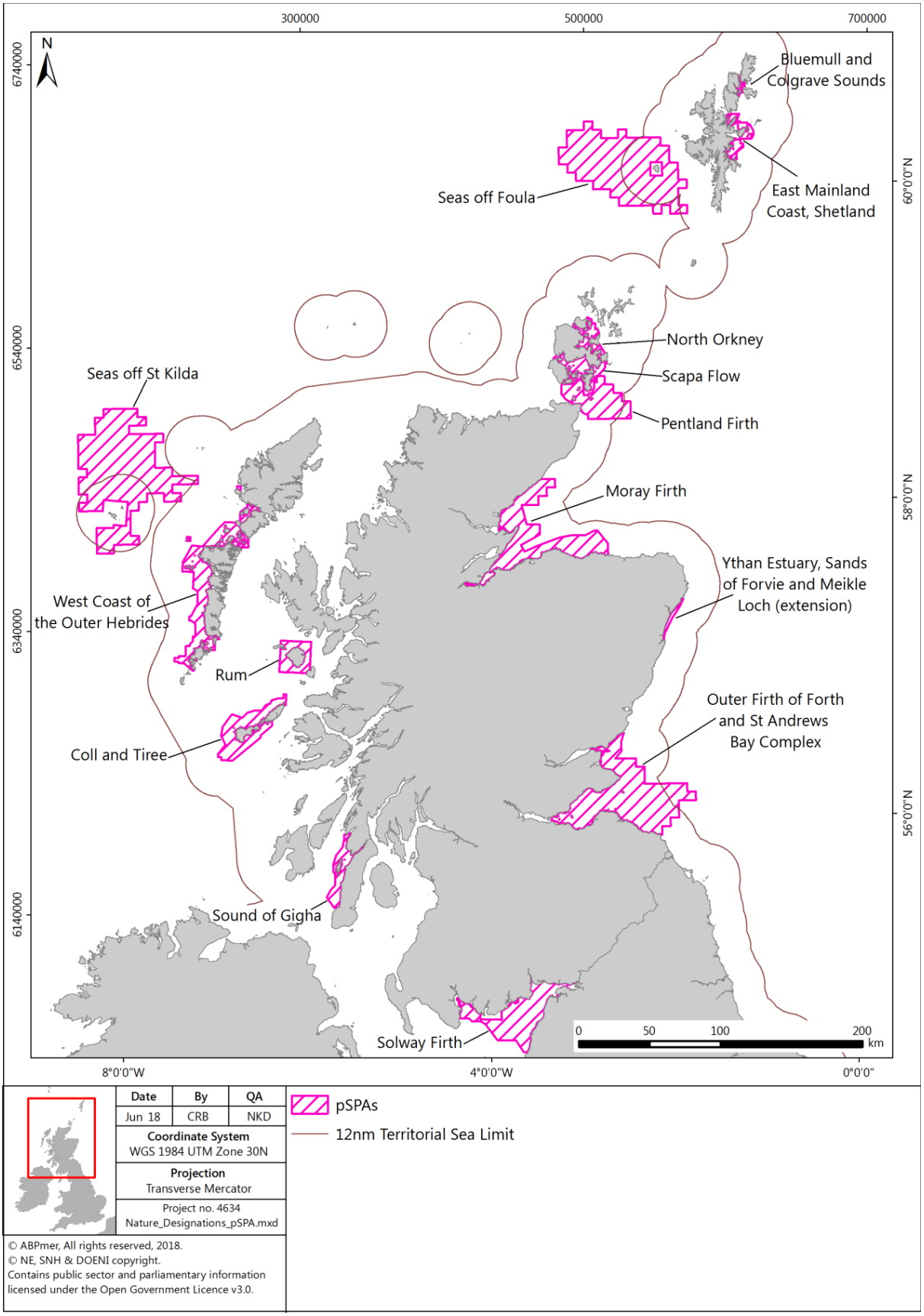


Table 1 Proposed SPAs and their proposed qualifying features

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
Exclusively in Scottish Territorial waters				
1. Bluemull and Colgrave Sounds	Marine waters to the north-east of Shetland (stretching from the north coast of Yell, east to Winna Ness on Unst, and down through Colgrave Sound, as far as White Hill of Vatsetter)	• Red-throated diver (*Gavia stellata)*	• N/A	• Provides important feeding grounds for over 190 pairs (15% of the British population) of breeding red-throated divers, whose breeding range in Great Britain is restricted to Scotland, Unst and Yell in particular
2. Coll and Tiree	West coast of Inner Hebrides (most of the marine waters between and surrounding the adjacent islands of Coll and Tiree excluding the south-east coast of Coll)	• N/A	• Common eider (*Somateria mollissima*) • Great northern diver (*Gavia immer)*	• Over 18% of the British (GB) great northern diver population and over 2% of the GB eider population spend the winter here • Supports third largest concentration of great northern divers on Scotland's west coast
3. East Mainland Coast	Waters east of Shetland, from Samphrey in the north to Aith Ness in the south	• Red-throated diver (*Gavia stellata)*	• Common eider (*Somateria mollissima*) • Great northern diver (*Gavia immer*) • Long-tailed duck (*Clangula hyemalis*) • Red-breasted merganser (*Mergus serrator*) • Slavonian grebe (*Podiceps auritus*)	• Supports over 7% of the wintering British (GB) great northern diver population as well as large numbers of grebes (5% GB Slavonian grebe population) and sea ducks (4% GB eider population; 1.5% GB long-tailed duck population; 2.8% GB red-breasted merganser population) • In the summer, area provides feeding grounds for over 15% of the GB population of red-throated divers

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
4. Moray Firth	• Extends seaward from the Helmsdale coast in the north, to Portsoy in the east and includes the outer Dornoch and Cromarty Firths, Beauly and Inverness Firths, as well as part of the wider Moray Firth	• European shag (*Phalacrocorax aristotelis*)	• Common eider (*Somateria mollissima*) • Common goldeneye (*Bucephala clangula*) • Common scoter (*Melanitta nigra*) • Great northern diver (*Gavia immer*) • Greater scaup (*Aythya marila*) • Long-tailed duck (*Clangula hyemalis*) • Red-breasted merganser (*Mergus serrator*) • Red-throated diver (*Gavia stellata)* • Slavonian grebe (*Podiceps auritus*) • Velvet scoter (*Melanitta fusca*)	• Attracts one of the largest concentrations of sea ducks and European shag in Great Britain yearlong, serving as both wintering and feeding grounds • In particular, the site hosts the largest British (GB) wintering populations of long-tailed duck, velvet scoter, and shag; the third largest population of scaup; and the largest Scottish wintering populations of common scoter and goldeneye
5. North Orkney	• Seas between Westray and Orkney Mainland, including the waters around all but the east coast of Shapinsay and south to Deer Sound	• Red-throated diver (*Gavia stellata)*	• Common eider (*Somateria mollissima*) • European shag (*Phalacrocorax aristotelis*) • Great northern diver (*Gavia immer)* • Long-tailed duck (*Clangula hyemalis*) • Red-breasted mergan-	• One of the most substantial concentrations of non-breeding wintering waterfowl can be found in the waters of North Orkney • In the summer, red-throated divers also flock to the area to feed

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
			ser (*Mergus serrator*) • Slavonian grebe (*Podiceps auritus*) • Velvet scoter (*Melanitta fusca*)	
6. Rum	• Island of Rum is found in the Inner Hebrides off the west coast of Scotland • The island and its immediate waters are already an SPA, with the marine component encompassing all the inshore waters of Rum out to Canna and the north coast of Eigg • Terrestrial component is intended to protect nesting red-throated diver, as well as golden eagle, kittiwake, guillemot, and Manx shearwater • In 2009, the SPA was extended into adjacent marine waters (by 4 km) to afford additional protection to Manx shear-	• Red-throated diver[44] (*Gavia stellata)*	• N/A	• Provides feeding grounds for 1.4% of the British population (18 pairs) of red-throated diver • Britain's red-throated divers only breed in Scotland and the large number of individuals that congregate on Rum, Eigg, and Canna is the basis for proposing that red-throated divers be added to Rum SPA's list of qualifying features

[44] Proposed as additional marine feature.

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
	water			
7. Scapa Flow	• Enclosed by Orkney Mainland to the north; Hoy, South Walls, and Flotta to the west and south; and Burray and South Ronaldsay to the east	• Red-throated diver (*Gavia stellata)*	• Great northern diver (*Gavia immer)* • Black-throated diver (*Gavia arctica*) • Slavonian grebe (*Podiceps auritus*) • Common eider (*Somateria mollissima*) • Long-tailed duck (*Clangula hyemalis*) • Common goldeneye (*Bucephala clangula*) • Red-breasted merganser (*Mergus serrator*) • European shag (*Phalacrocorax aristotelis*)	• Hosts the largest population of inshore wintering red-breasted merganser in Scotland as well as the largest population of Slavonian grebe in Scotland and GB • Acts as an important foraging area for a high concentration of red-throated diver nesting territories on adjacent islands and Hoy SPA and Orkney Mainland Moors SPA
8. Sound of Gigha	• Island of Gigha lies off the west coast of Kintyre peninsula, mainland Scotland • Proposed SPA covers waters surrounding Gigha and spans north to Point of Knap, south to Machrihanish and includes the waters across to the mainland	• N/A	• Common eider (*Somateria mollissima*) • Great northern diver (*Gavia immer)* • Red-breasted merganser (*Mergus serrator*)	• A primary west coast wintering ground for over 20% of the British population of red-throated divers (over 500 individuals), along with significant numbers of eiders and mergansers
9. West Coast of the Outer Hebrides	• Includes much of the south west coast of the Outer Hebrides, running from the north-west	• Red-throated diver (*Gavia stellata)*	• Black-throated diver (*Gavia arctica*) • Common eider (*Somateria mollissima*)	• Supports the largest concentration of wintering great northern divers in Britain as well as significant numbers of other wintering water-

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
	coast of Harris, along the west coasts of North Uist, Benbecula and South Uist, to the south of Sandray (south of Barra)		• Great northern diver (*Gavia immer)* • Long-tailed duck (*Clangula hyemalis*) • Red-breasted merganser (*Mergus serrator*) • Slavonian grebe (*Podiceps auritus*)	fowl including eider, long-tailed ducks, red-breasted merganser, and Slavonian grebe • Also supports one of just three substantial populations of wintering black-throated divers as well as providing feeding grounds for breeding red-throated divers during the summer months
10. Ythan Estuary, Sands of Forvie and Meikle Loch	• Ythan Estuary, Sands of Forvie and Meikle Loch is already subject to a Special Protection Area designation, supporting internationally significant numbers of wintering waterfowl and breeding populations of common, Sandwich, and little tern • The present proposal seeks to extend the SPA into the marine environment to safeguard foraging areas as well as protect addition-	• Little tern[45] (*Sternula albifrons*) • Sandwich tern[46] (*Sterna sandvicensis*)	• Lapwing[47] (*Vanellus vanellus*) • Redshank[48] (*Tringa totanus*)	• The marine extension to the existing SPA comprises fairly shallow seas and sandy sediments that support numerous small fish species such as mackerel, herring, and sandeels which both Sandwich and little tern depend upon for food

[45] This species will receive further protection through the proposed extension of the existing SPA.

[46] This species will receive further protection through the proposed extension of the existing SPA.

[47] This species is proposed as an additional component of the existing SPA.

[48] This species is proposed as an additional component of the existing SPA.

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	**Non-breeding**	
	al species within the existing SPA • In practice, this would apply to marine waters within 3 km of the coast stretching from Aberdeen harbour northwards to Cruden Bay			
Contain offshore components				
11. Outer Firth of Forth and St Andrews Bay Complex	• Stretches from Arbroath to St Abb's Head and covers the Firth of Forth, the outer Firth of Tay, and St Andrews Bay	• Arctic tern (*Sterna paradisaea)* • Atlantic puffin (*Fratercula arctica*) • Common guillemot (*Uria aalge*) • Common tern (*Sterna hirundo*) • European shag (*Phalacrocorax aristotelis*) • Herring gull (*Larus argentatus*) • Kittiwake (*Rissa tridactyla*) • Manx shearwater (*Puffinus puffinus*) • Northern gannet (*Morus bassanus*) • Seabird assemblage	• Black-headed gull *(Chroicocephalus ridibundus)* • Common eider (*Somateria mollissima*) • Common goldeneye (*Bucephala clangula*) • Common guillemot (*Uria aalge*) • Common gull (*Larus canus*) • Common scoter (*Melanitta nigra*) • European shag (*Phalacrocorax aristotelis*) • Herring gull (*Larus argentatus*) • Kittiwake (*Rissa tridactyla*) • Little gull (*Hydrocoloeus minutus*) • Long-tailed duck	• Site of one of Scotland's largest and most diverse marine bird concentrations (e.g. winter home of over 35% of the eider and over 23% of the velvet scoter British [GB] population) • Similarly, more than 1% of the GB populations of over 13 different marine bird species aggregate in the area over the summer, including gannets, kittiwakes, puffins, and terns

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
			(*Clangula hyemalis*) • Razorbill (*Alca torda*) • Red-breasted merganser (*Mergus serrator*) • Red-throated diver (*Gavia stellata)* • Slavonian grebe (*Podiceps auritus*) • Velvet scoter (*Melanitta fusca*) • Waterfowl assemblage • Seabird assemblage	
12. Pentland Firth	• Comprises the waters of the central and eastern Pentland Firth, between the southern entrance to Scapa Flow in Orkney and the Caithness coast and extending some 20 km east into the North Sea off John O'Groats	• Arctic skua (*Stercorarius parasiticus)* • Arctic tern (*Sterna paradisaea)* • Common guillemot (*Uria aalge*) • Breeding seabird assemblage	• N/A	• Recognised as being a regular feeding ground for over 30,000 common guillemot, representing roughly 2% of the total British population; the cluster off the Pentland Firth is the largest found in Scotland's seas • Used by breeding Arctic terns (approximately 2% of the GB population) and the Arctic skua, which in Britain breed exclusively in northern Scotland
13. Seas off Foula	• Foula and its immediate waters are already protected by way of the existing Foula SPA • The proposed Seas off Foula SPA supports the existing SPA by protecting the foraging waters	• Arctic skua (*Stercorarius parasiticus)* • Atlantic puffin (*Fratercula arctica*) • Common guillemot (*Uria aalge*) • Great skua (*Stercorari-*	• Common guillemot (*Uria aalge*) • Great skua (*Stercorarius skua*) • Northern fulmar (*Fulmarus glacialis*) • Seabird assemblage	• Island of Foula hosts more than 190,000 breeding seabirds, one of the largest and most well-established seabird colonies in Britain • In particular, more than 5% of the British great skua population relies on the area for its foraging activi-

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
	and prey such as sandeels, on which the seabirds depend	*us skua*) • Northern fulmar (*Fulmarus glacialis*) • Seabird assemblage		ties
14. Seas off St. Kilda	• Encircles the waters around the St Kilda archipelago, more than 50 km west of North Uist in the Outer Hebrides • Proposed area is near to the continental shelf edge, where the seabed descends rapidly from depths of about 100 m in the east of the area to over 400 m in the north-west • The shelf edge to the north-west of St. Kilda was classified as a Marine Protected Area (Geikie Slide and Hebridean Slope Nature Conservation MPA) in 2014	• Atlantic puffin (*Fratercula arctica*) • Common guillemot (*Uria aalge*) • European storm-petrel (*Hydrobates pelagicus*) • Northern fulmar (*Fulmarus glacialis*) • Northern gannet (*Morus bassanus*) • Seabird assemblage	• N/A	• Notable as having the largest, oldest, and most impressive marine seabird community in western Europe as well as for being one of the most important communities in the whole North Atlantic

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
Contain cross-border components with England				
15. Solway Firth	• The proposed SPA serves as an extension to the existing Upper Solway Flats & Marshes SPA by incorporating important wintering grounds for red-throated diver, common scoter, and goosander into the existing area as well as expanding the number of species for which the SPA is intended • Situated within the marine waters west of the existing SPA, between Whitehaven (England) and Wigtown Bay (Scot-	• N/A	• Common scoter[49] (*Melanitta nigra*) • Goosander[50] (*Mergus merganser*) • Red-throated diver[51] (*Gavia stellata)* • Black-headed gull[52] *(Chroicocephalus ridibundus)* • Common gull[53] (*Larus argentatus*) • Cormorant[54] (*Phalacrocorax carbo*) • Herring gull[55] (*Larus argentatus*) • Lapwing[56] (*Vanellus vanellus*) • Ringed plover[57] (*Charadrius hiaticula*)	• Area is frequented by red-throated diver (over 3% of the British [GB] population), common scoter (nearly 2% of the GB population), and goosander (slightly more than 1% of the GB population) during the winter months

[49] Common scoter is a new species included in the proposed marine extension. Further, it is a named water bird assemblage qualifier.

[50] Goosander is a new species included in the proposed marine extension. Further, it is a named water bird assemblage qualifier.

[51] Red-throated diver is a new species included in the proposed marine extension.

[52] Black-headed gull is a proposed addition to the existing part of the SPA. Further, it is a named water bird assemblage qualifier.

[53] Common gull is a proposed addition to the existing part of the SPA. Further, it is a named water bird assemblage qualifier.

[54] Cormorant is a proposed addition to the existing part of the SPA. Further, it is a named water bird assemblage qualifier.

[55] Herring gull is a proposed addition to the existing part of the SPA. Further, it is a named water bird assemblage qualifier.

[56] Lapwing is a proposed addition to the existing part of the SPA. Further, it is a named water bird assemblage qualifier.

[57] Ringer plover is a proposed addition to the existing part of the SPA.

Site name	Location	Proposed qualifying features		Characteristics
		Breeding	Non-breeding	
	land)			

Table 2 Possible management advice options that may be applied at sites

- Reduce or limit entanglement pressures associated with new finfish farms or undeveloped finfish farm consents as well as the expansion or relocation of existing fish farms through application of best practice;
- Reduce or limit pressures associated with the use of anti-predator netting at shellfish farms within the pSPA by following best practice;
- Reduce or limit pressures associated with disturbance by maintenance vessels and predator deterrents;
- Remove or avoid pressures associated with fishing/trawling for sandeels;
- Remove or avoid pressures associated with fishing/benthic dredging that have the potential to damage sandeel habitat;
- Prohibit the use of fixed bottom set nets and fyke nets in areas identified as being important for certain qualifying features (seasonal restriction);
- Prohibit the use of drift nets in areas identified as being important for certain qualifying features (seasonal restriction);
- Prohibit the use of all set (gill) nets in areas identified as being important for certain qualifying features (seasonal restriction);
- Prohibit the use of set nets at finfish farms for recapture of escaped farmed stock within the pSPA (seasonal restriction);
- Reduce the pressures associated with new ship to ship transfers in the pSPA;
- Remove, avoid or reduce/limit collision pressures associated with offshore and/or marine renewables for qualifying features; and
- Remove or avoid displacement pressures associated with offshore and/or marine renewables in areas identified as being important for certain qualifying features.

2.4 Policy context of marine SPAs

2.4.1 Both the 2005 Act and the 2004 Regulations require Responsible Authorities to identify the broader policy context in which the plan is situated and any environmental protection objectives that will influence its development and implementation.

2.4.2 The overall policy context is illustrated in Figure 2, where solid arrows and bold, underlined text indicates the primary legislative drivers for pSPAs. Dashed lines indicate other legislation or policies that influence pSPAs and/or are influenced by pSPAs.

2.4.3 This section sets out the wider policy context in which the pSPAs, as a component of the greater MPA network, sit. A detailed review of the overarching marine policy objectives and the environmental protection objectives of the SEA topics scoped into the assessment (Section 3.2) is included in Appendix B.

MPA network

2.4.4 In addition to being legal requirements under the Birds Directive and Habitats Directive, respectively, marine SPAs and SACs are one example of a Marine Protected Area (MPA) in Scotland, the others being Nature Conservation MPAs, Demonstration and Research MPAs, Historic MPAs, and Sites of Special Scientific Interest (SSSIs)[58]. The overall MPA network is intended to help protect nationally and internationally important marine wildlife, habitats, and underwater geodiversity, while also benefiting the greater marine environment, coastal communities, marine industries, and recreational users[59].

2.4.5 The MPA network fulfils a number of legislative and conservation needs. They are a key element of the Scottish Government's commitment to ensuring the sustainable management of the marine environment and balancing the competing interests of use and protection of the sea. They contribute to progress towards Good Environmental Status (GES) as set out by the Marine Strategy Framework Directive

[58] Scottish Government (2017) Marine Protected Areas (MPAs) [online] Available at: http://www.gov.scot/Topics/marine/marine-environment/mpanetwork (accessed 24/01/2018)

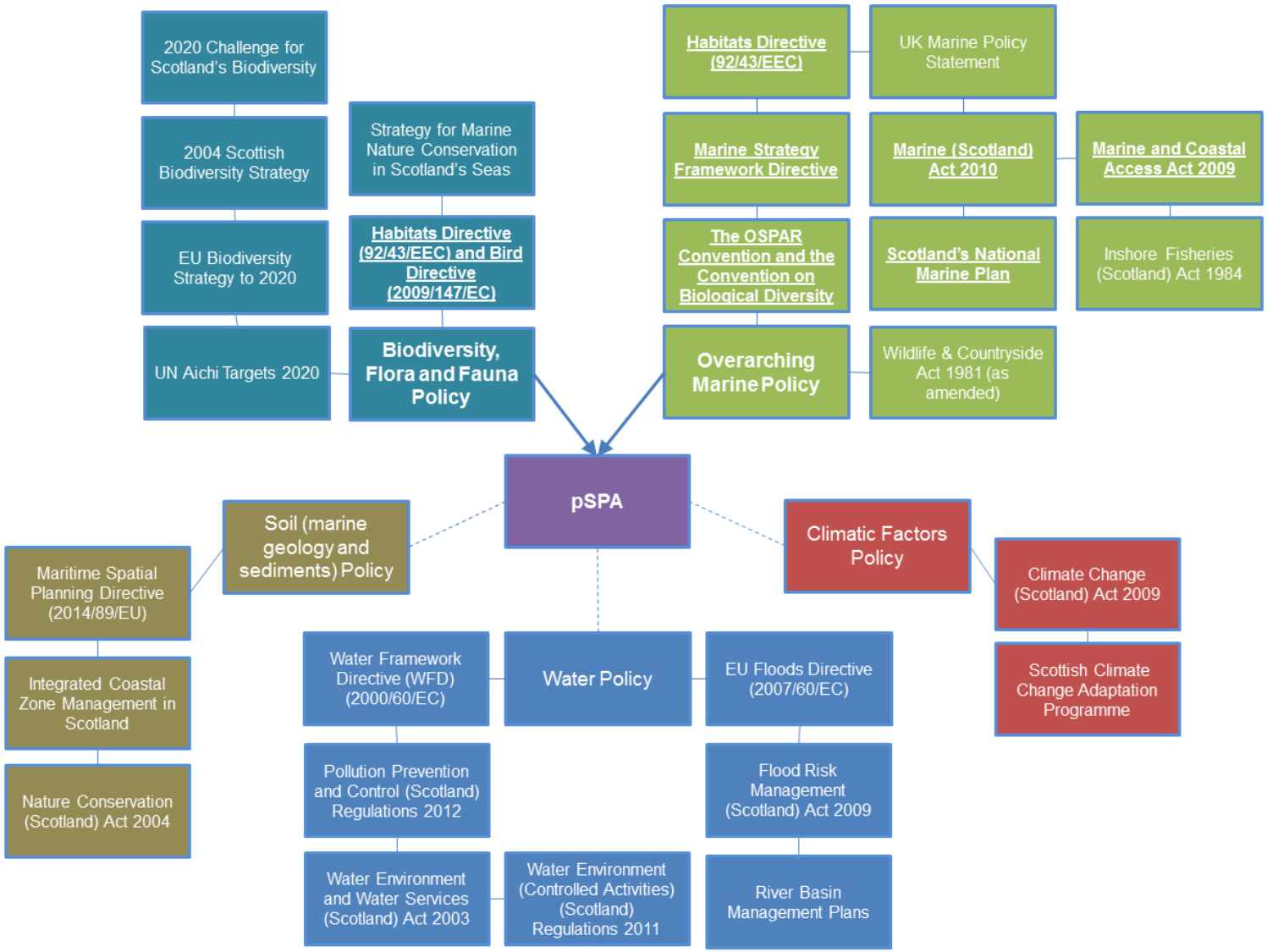
[59] ibid

2008/56/EC[60]. They also form part of the OSPAR Convention network of protected sites found throughout the north-east Atlantic Ocean[61].

[60] Scottish Government (2011) Marine Protected Areas in Scotland's Seas – Guidelines on the selection of MPAs and development of the MPA network [online] Available at: http://www.gov.scot/resource/doc/295194/0114024.pdf (accessed 13/12/2017)

[61] ibid

Figure 2 pSPAs: Policy context



3 Approach to the Assessment

3.1 Purpose of the Assessment

3.1.1 The purpose of this SEA is to assess the potential for likely significant environmental effects that may arise from the classification of the pSPAs. This will allow corresponding mitigation measures to be identified where necessary and highlight opportunities for enhancement in cases where beneficial effects are likely.

3.1.2 In order to undertake a meaningful assessment, the recommended management advice in the "Advice to Support Management" documents have been used to indicate what environmental changes may arise from the classification and management of the pSPAs (Table 2). Any specific management measures that are subsequently required to meet the objectives of the pSPAs will be subject to further consideration under the 2005 Act.

3.2 Scope of the Assessment

3.2.1 It is not considered within the scope of this SEA to provide justification for the selection of the pSPAs or to evaluate their effectiveness at fulfilling the objectives of the Birds Directive. The scientific case for site selection for each pSPA is summarised in its respective Site Selection Document[62]. In addition, details on the data, analysis methods, and general species ecology and behaviour that underpin the selection process are provided by the JNCC Reports series while JNCC generic documents provide non-technical supplementary advice[63]. Additionally, based on a Socio-Economic Impact Assessment (SEIA) undertaken for the pSPA designation, Business and Regulatory Impact Assessments (BRIAs) have been undertaken for each pSPA in order to identify any potential socio-economic impacts that may result from the implementation of the proposals.

[62] Scottish Government (2016) Special Protection Areas in the Marine Environment Q&A [online] Available at: http://www.gov.scot/Resource/0050/00507009.pdf (accessed 08/01/2017)

[63] ibid

3.2.2 An initial review of the environmental topics set out in Schedule 3 of the 2005 Act[64] suggests that potentially significant environmental effects would be focused on 'Biodiversity, Flora, and Fauna', 'Soil', 'Water' and 'Climatic Factors' (including regulation of climate). The Screening and Scoping Report proposed that the SEA should consider all these topics under the topic of 'Biodiversity, Flora and Fauna'. The rationale for this and for the scoping in and out of each of the SEA topics is provided in Table 3.

[64] Scottish Government (2005) Environmental Assessment (Scotland) Act 2005 [online] Available at: https://www.legislation.gov.uk/asp/2005/15/schedule/3 (accessed 14/05/2018)

Table 3 Proposed scoping in/out of SEA topics

SEA topic	In/ out	Reasons for inclusion / exclusion
Biodiversity, Flora, and Fauna	In	The SPA classification is intended to prevent the disturbance and deterioration of the site as a whole, rather than only protecting the bird species for which the site has been classified. As such, the pSPAs are likely to lead to direct benefits for 'Biodiversity, Flora, and Fauna' and 'Soil' (specifically, seabed strata and/or bottom sediments), with the potential for secondary benefits extending to 'Water' (in terms of ecological status) and 'Climatic Factors' (in terms of blue carbon).
Population and Human Health	Out	It is proposed that Population and Human Health be scoped out of the assessment as the classification of the pSPAs is unlikely to lead to any significant impacts on this receptor.
Soil	In	The Birds Directive seeks to protect vulnerable bird species by ensuring access to quality habitat, which is in turn dependent upon factors such as soil condition. The protection afforded to soil (specifically, seabed strata and/bottom sediments) by the pSPAs is a direct result of the sites being classified and managed for the benefit of biodiversity. Further, any impacts on soil are likely to be framed in terms of how said impacts either benefit or compromise the integrity of the habitat. As such, it is proposed that the topic of 'Soil' be scoped into the assessment under the topic of 'Biodiversity, Flora, and Fauna'. In addition, the proposals could contribute towards achieving and maintaining 'GES' as required by the Marine Strategy Framework Directive 2008/56/EC (specifically, the indicator relating to protecting and improving the condition of the seafloor in order to support the health of the greater marine environment).
Water	In	The primary impact on water is likely to arise through maintaining or working towards 'Good Ecological Status', as required by the Water Framework Directive 2000/60/EC[65]. This classification is based on specific criteria that include a measure of biodiversity. Given this link, it is proposed that effects on ecological status be covered under the topic of 'Biodiversity, Flora, and Fauna'.
Air	Out	It is considered unlikely that the classification of the pSPAs will impact on Air Quality and as such, it is proposed that this topic be scoped out.
Climatic Factors	In	'Blue carbon' features such as seagrass beds and kelp forests may play a role in reducing and adapting to the effects of climate change by sequestering and storing carbon. The pSPAs could extend protection to blue carbon stores that lie within their boundaries by affording protection to biodiversity more generally. It is therefore proposed that the potential impact of the pSPAs on 'Climatic Factors' as they relate to carbon sequestration and blue carbon

[65] European Commission (2000) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060 (accessed 19/01/2018)

SEA topic	In/ out	Reasons for inclusion / exclusion
		be assessed within the context of 'Biodiversity, Flora, and Fauna'.
Material Assets	Out	The classification of the pSPAs as such is unlikely to impact upon 'Material Assets'. However, it is recognised that the development and implementation of any corresponding management measures may have an influence on activities within the classified area, with the potential for impacts such as displacement to arise. Any management measures would also be subject to consideration under the 2005 Act and the potential for associated environmental impacts would be considered at that time. As such, it is proposed that the topic of 'Material Assets' be scoped out of the assessment.
Cultural Heritage	Out	An SPA classification introduces a stricter consenting regime applying to certain activities and forms of development, which could indirectly benefit cultural heritage. However, this is dependent upon the location and extent of the submerged resource. Further, conservation and cultural heritage objectives would need to be compatible (e.g. some historic features may require excavation in order to ensure their preservation, which may be at odds with conservation interests). At this time, such impacts are not predicted to be significant and so it is proposed that 'Cultural Heritage' be scoped out of the assessment.
Landscape/Seascape	Out	As is the case with 'Cultural Heritage', it is possible that landscape and seascape may benefit indirectly from the pSPAs, as proposed activities and developments are likely to undergo a more stringent consenting process in line with Habitats Directive legislation relating to the management of the Natura network. At this time, such impacts are not predicted to be significant and so it is proposed that 'Landscape/Seascape' be scoped out of the assessment.

3.3 Assessment methods

3.3.1 The assessment of potential effects that may result from the classification of pSPAs has been undertaken as a relatively high-level and qualitative assessment, guided by the SEA objectives proposed within Table 4.

3.3.2 The SEA objectives have been based on the objectives used to inform the SEA of the Nature Conservation MPAs and amended to reflect the proposed scope and environmental protection objectives relevant to the present assessment.

3.3.3 Following feedback from the Consultation Authorities on the combined Screening and Scoping Report, the proposed SEA objective "*To maintain and protect the character and integrity of the seabed*" was extended to include specific reference to avoidance of pollution of the seabed strata / bottom sediments.

Table 4 SEA objectives

SEA topic	SEA objective
Biodiversity, Flora, and Fauna	• To safeguard marine and coastal ecosystems, including species and habitats, and their interactions; and • To avoid pollution of the coastal and marine water environment.
Soil	• To maintain and protect the character and integrity of the seabed including avoidance of pollution of the seabed strata/seabed sediments.
Water	• To maintain or work towards achieving good ecological status.
Climatic Factors	• To preserve and enhance existing marine carbon stocks and carbon sequestration potential.

3.3.4 The environmental changes that are likely to result from the classification of pSPAs and associated management of licensed activities have been assessed. In addition, the changes that may result from the possible future implementation of the recommended options for managing fishing activities within the pSPAs have also been assessed drawing from the 'Advice to Support Management' documents[66] (Table 2).

3.3.5 The assessment of potential environmental effects has focused on how the overarching topic 'biodiversity, flora and fauna' and the SEA objectives will be affected by any change in environmental pressures as a result of the classification and management of the sites, taking account of the nature and

[66] Scottish Government, Management Options Papers for SPA sites, SPA Workshop 2016 - Supplementary Documents [online] Available at https://www.gov.scot/Topics/marine/marine-environment/mpanetwork/marinespas/spaworkshop/spaworlshopdocuments (accessed 01/08/2018)

scale of changes, feature sensitivities, the baseline environment and expert judgement.

3.3.6 Of the 15 pSPAs that are being classified, 10 lie entirely within Scottish territorial waters (within 12 nm of the territorial limit). An additional four sites have offshore components and one (Solway Firth pSPA) has cross-border components with England. As such, the assessment has evaluated the potential for cross-border impacts.

3.4 Building on Previous Assessments

3.4.1 The classification and management of the pSPAs is similar to the designation and management of Nature Conservation MPAs[67] in that both contribute to Scotland's MPA network. As such, the methodology underlying the assessment of the designation of Nature Conservation MPAs in 2014[68] and the first and second phase of fisheries management measures for inshore MPAs/SACs[69] has been used to inform the present assessment.

3.4.2 Other relevant sources of information include the SEAs undertaken on the draft Sectoral Marine Plans for Offshore Renewable Energy in Scottish Waters[70], Management Proposals of Inshore Fisheries Groups[71], the Seaweed Policy Statement[72] and Wild Seaweed Harvesting[73], as well as the ongoing SEA and consultation on the draft Sectoral Marine Plan for Offshore Wind Encompassing Deep Water Options[74] and the plan to improve protection given to Priority Marine Features (PMFs) outside the MPA network[75].

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[67] Scottish Government (2013) Planning Scotland's Seas: 2013 – Possible Nature Conservation Marine Protected Areas Consultation Overview – Strategic Environmental Assessment Report [online] Available at: http://www.gov.scot/Resource/0043/00430615.pdf (accessed 24/01/2017)

[68] ibid

[69] Marine Scotland (in prep). SEA of Proposed Inshore MPA/SAC Fisheries Management Measures Phase 2 Strategic Environmental Assessment Environmental Report.

[70] Scottish Government (2013) Planning Scotland's Seas: Draft Sectoral Marine Plans for Offshore Renewable Energy in Scottish Waters – Strategic Environmental Assessment: Environmental Report and Appendix A [online] Available at: http://www.gov.scot/Publications/2013/07/2403/0 (accessed 25/01/2018).

[71] Scottish Government (2013) Management Proposals of Inshore Fisheries Groups – Strategic Environmental Assessment – Environmental Report [online] Available at: http://www.gov.scot/Resource/0043/00430277.pdf (accessed 25/01/2018).

[72] Scottish Government (2013) Seaweed Policy Statement Consultation Document – Environmental Report [online] Available at: http://www.gov.scot/Resource/0043/00432098.pdf (accessed 25/01/2018).

[73] Scottish Government (2016) Wild Seaweed Harvesting Strategic Environmental Assessment Environmental Report [online] Available at: http://www.gov.scot/Publications/2016/11/6869/0 (accessed 01/02/2018).

[74] https://consult.gov.scot/marine-scotland/offshore-wind-scoping/

[75] https://consult.gov.scot/marine-scotland/priority-marine-features/

3.5 Reasonable alternatives

3.5.1 The Birds Directive does not list formal criteria for the classification of SPAs[76], other than to say that "Member States shall classify in particular the most suitable territories in number and size as special protection areas for the conservation of these species in the geographical sea and land area where this Directive applies"[77].

3.5.2 Three alternative scenarios (high, medium and low), which vary the inclusion of species as qualifying features at each pSPA, have been assessed. These are based on a network assessment undertaken by SNH that sets out why the groups of sites proposed are considered the most suitable territories and confirms the contribution the pSPAs and the species represented make to the Scottish MPA network. The species proposed for classification under each scenario are summarised in Table 5.

3.5.3 The status quo (i.e. not classifying the pSPAs) is not a reasonable alternative as the classification of these sites is considered necessary to meet the obligations of the Birds Directive.

[76] JNCC (2017) Special Protection Areas (SPAs) [online] Available at: http://jncc.defra.gov.uk/page-162 (accessed 11/01/2018)

[77] European Commission (2009) Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version) [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147 (accessed 11/01/2018)

Table 5 Qualifying features included in alternative scenarios

OSPAR Region	**II: Greater North Sea**									**III: Celtic Seas** (***part of Seas off St Kilda in Region V: wider Atlantic***)					
Species (season)	**Bluemull and Colgrave Sounds**	**East Mainland Coast, Shetland**	**Seas off Foula**	**North Orkney**	**Scapa Flow**	**Pentland Firth**	**Moray Firth**	**Ythan Estuary, Sands of Forvie & Meikle Loch**	**Outer Firth of Forth & St Andrews Bay Complex**	**Solway Firth**	**Sound of Gigha**	**Coll and Tiree**	**Rum**	**West Coast Outer Hebrides**	**Seas off St Kilda**
Great northern diver (nb)		L,M,H		L,M,H	L,M,H		L,M,H				L,M,H	L,M,H		L,M,H	
Black-throated diver (nb)					L,M,H									L,M,H	
Red-throated diver (b)	M,H	L,M,H		H	L,M,H								L,M,H	L,M,H	
Red-throated diver (nb)							L,M,H		L,M,H	L,M,H					
Slavonian grebe (nb)		L,M,H		L,M,H	L,M,H		L,M,H		L,M,H		L,M,H			L,M,H	
Greater scaup (nb)							L,M,H								
Common eider (nb) (*S. m. mollissima*)				H	L,M,H		M,H		L,M,H		M,H	L,M,H		L,M,H	
Common eider (nb) (*S. m. faeroeensis*)		L,M,H													
Long-tailed duck (nb)		H		H	M,H		L,M,H		L,M,H					L,M,H	
Common scoter (nb)							M,H		L,M,H	L,M,H					
Velvet scoter (nb)				L,M,H			L,M,H		L,M,H						
Common goldeneye (nb)					H		L,M,H		L,M,H						
Red-breasted merganser (nb)		H		H	L,M,H		M,H		L,M,H		L,M,H			L,M,H	

OSPAR Region	**II: Greater North Sea**									**III: Celtic Seas** (***part of Seas off St Kilda in Region V: wider Atlantic***)					
Species (season)	**Bluemull and Colgrave Sounds**	**East Mainland Coast, Shetland**	**Seas off Foula**	**North Orkney**	**Scapa Flow**	**Pentland Firth**	**Moray Firth**	**Ythan Estuary, Sands of Forvie & Meikle Loch**	**Outer Firth of Forth & St Andrews Bay Complex**	**Solway Firth**	**Sound of Gigha**	**Coll and Tiree**	**Rum**	**West Coast Outer Hebrides**	**Seas off St Kilda**
Goosander (nb)										L,M,H					
Common tern (b)									L,M,H						
Arctic tern (b)						L,M,H			L,M,H						
Sandwich tern (b)								L,M,H							
Little tern (b)								L,M,H							
Little gull (nb)								L,M,H							
European storm petrel (b)															L,M,H
Manx shearwater (b)									L,M,H						
Northern fulmar (b)			L,M,H												L,M,H
Northern fulmar (nb)			L,M,H												
Northern gannet (b)									L,M,H						L,M,H
European shag (b)							L,M,H		L,M,H						
European shag (nb)				H	L,M,H		L,M,H		L,M,H						
Arctic skua (b)			L,M,H			L,M,H									
Great skua (b)			L,M,H												
Great skua (nb)			L,M,H												

OSPAR Region	**II: Greater North Sea**									**III: Celtic Seas** (***part of Seas off St Kilda in Region V: wider Atlantic***)					
Species (season)	**Bluemull and Colgrave Sounds**	**East Mainland Coast, Shetland**	**Seas off Foula**	**North Orkney**	**Scapa Flow**	**Pentland Firth**	**Moray Firth**	**Ythan Estuary, Sands of Forvie & Meikle Loch**	**Outer Firth of Forth & St Andrews Bay Complex**	**Solway Firth**	**Sound of Gigha**	**Coll and Tiree**	**Rum**	**West Coast Outer Hebrides**	**Seas off St Kilda**
Black-legged kittiwake (b)									L,M,H						
Black-legged kittiwake (nb)									L,M,H						
Black-headed gull (nb)									L,M,H	L,M,H					
Common gull (nb)									L,M,H	L,M,H					
Herring gull (b)									L,M,H						
Herring gull (nb)									L,M,H	L,M,H					
Common guillemot (b)			L,M,H			M,H			L,M,H						L,M,H
Common guillemot (nb)			L,M,H						L,M,H						
Razorbill (nb)									L,M,H						
Atlantic puffin (b)			L,M,H						L,M,H						L,M,H

Annex I Species in **bold**

b Breeding

nb Non-breeding

L Low

M Medium

H High

4 Environmental Baseline

4.1 Introduction

4.1.1 This section of the Environmental Report describes the character of the environment which may be affected by the classification and management of the pSPAs. The focus of this baseline information is therefore on biodiversity, flora and fauna; geodiversity; the ecological/environmental status of water bodies, and climatic factors, reflecting the scope of the assessment as described in Section 3.2.

4.1.2 Scotland's location at the edge of the continental shelf means that it is subject to both subpolar and subtropical influences. The North Atlantic current brings warm water from the Gulf of Mexico to the west coast of Scotland. These warm waters mix with cooler nutrient rich polar waters.

4.1.3 Scotland has over 18,000 km of coastline and its inshore and offshore areas are among the largest of any EU country, representing 13% of all European seas.

4.2 Biodiversity, flora and fauna

4.2.1 Scotland's marine environment supports a diverse complex of different habitats, which in turn support a wide range of marine plants and animals. Estimates suggest there are around 6,500 species of animals and plants (excluding microbial flora and seabirds) in Scotland's seas[78].

Marine habitats

4.2.2 The seabed is a critical component of marine ecosystems. Overall, mud, sand and coarse sediment are found in the North Sea and to the west of the Hebrides. The seabed in the far west and far north of Scotland is characterised by mud and fine clay, with coarser sediments in shallower water and on banks and seamounts[79].

4.2.3 The latest information on predicted seabed habitats is provided by the National Marine Plan Interactive (NMPi)[80] and EMODnet

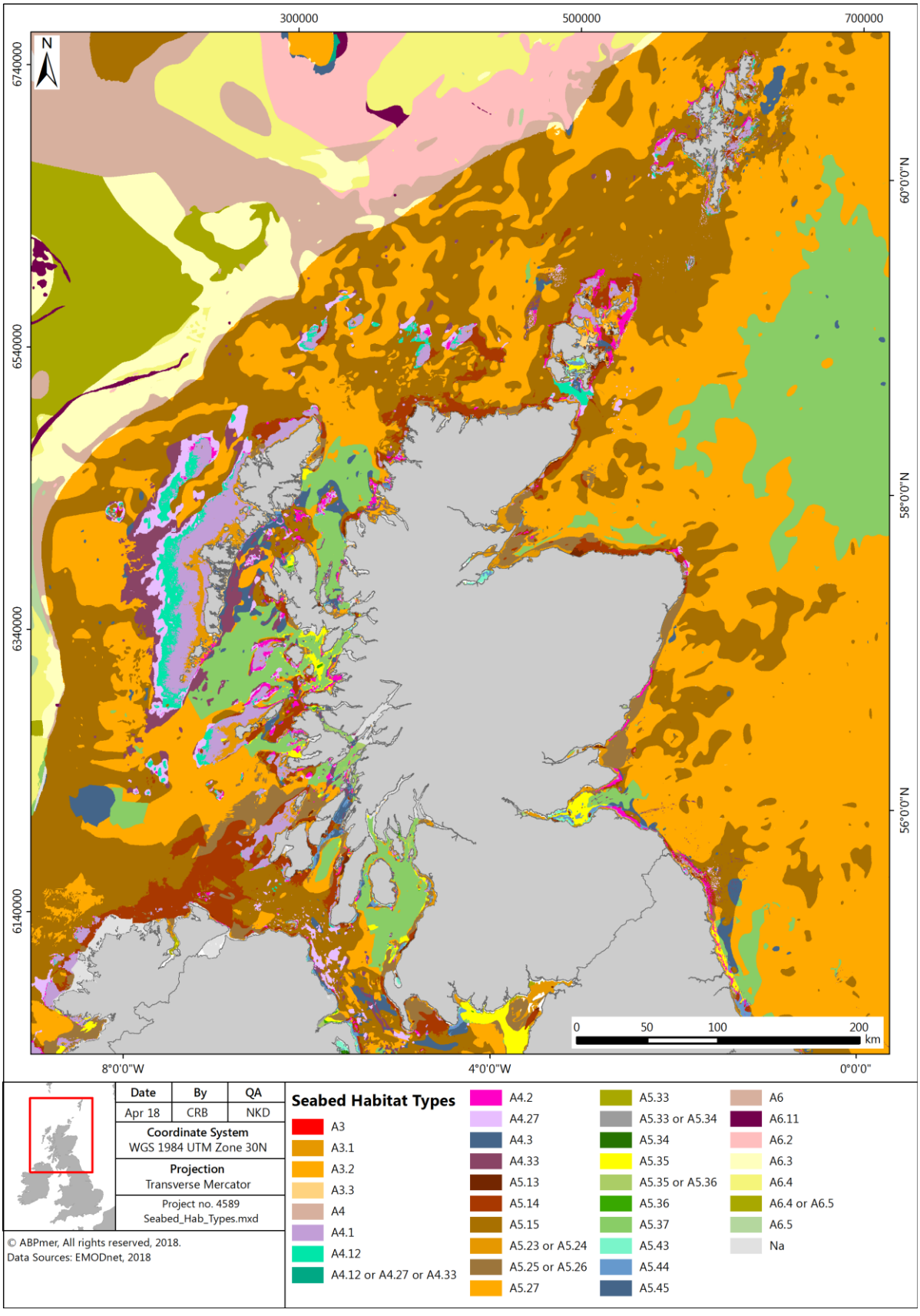
[78] Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

[79] UK Marine Monitoring and Assessment Strategy (UKMMAS) (2010) Charting Progress 2: An assessment of the state of UK seas.

[80] National Marine Plan interactive (NMPi). Available at http://www.scotland.gov.uk/topics/marine/seamanagement/nmpihome (accessed 25/01/2018)

Seabed Habitats Phase 2 mapping (EUSeaMap, 2016). The layer is a predictive European Nature Information System (EUNIS) seabed habitat map for the UK continental shelf, which has been created using five pre-processed input datasets: substrate, biological zone, energy, salinity and biogeographic region (Figure 3 and key below).

Figure 3 Predicted seabed habitat types in Scotland's marine environment



[Full key is provided below figure]

Key for Figure 3.

Key			
A3	Infralittoral rock and biogenic reef	A5.33	Infralittoral mud
A3.1	Infralittoral rock and biogenic reef	A5.33 or A5.34	Infralittoral mud
A3.2	Infralittoral rock and biogenic reef	A5.34	Infralittoral mud
A3.3	Infralittoral rock and biogenic reef	A5.35	Circalittoral mud
A4	Circalittoral rock and biogenic reef	A5.35 or A5.36	Circalittoral mud
A4.1	Circalittoral rock and biogenic reef	A5.36	Circalittoral mud
A4.12	Offshore circalittoral rock and biogenic reef	A5.37	Offshore circalittoral mud
A4.12 or A4.27 or A4.33	Offshore circalittoral rock and biogenic reef	A5.43	Infralittoral mixed sediment
A4.2	Circalittoral rock and biogenic reef	A5.44	Circalittoral mixed sediment
A4.27	Offshore circalittoral rock and biogenic reef	A5.45	Offshore circalittoral mixed sediment
A4.3	Circalittoral rock and biogenic reef	A6	Upper bathyal sediment
A4.33	Offshore circalittoral rock and biogenic reef	A6.11	Upper bathyal rock and biogenic reef
A5.13	Infralittoral coarse sediment	A6.2	Upper bathyal sediment
A5.14	Circalittoral coarse sediment	A6.3	Upper bathyal sediment
A5.15	Offshore circalittoral coarse sediment	A6.4	Upper bathyal sediment
A5.23 or A5.24	Infralittoral sand	A6.4 or A6.5	Upper bathyal sediment
A5.25 or A5.26	Circalittoral sand	A6.5	Upper bathyal sediment
A5.27	Offshore circalittoral sand	Na	Not applicable (land)

Mobile species

4.2.4 Scotland's marine environment supports a wide range of mobile species. These include:

- Seals (grey and harbour);
- Cetaceans (23 species have been recorded in Scottish waters over the last 25 years; of these, 11 are regularly sighted);
- Birds (both breeding seabirds and overwintering waterbirds discussed further below);
- Sharks and rays, including basking shark and common skate;
- Commercial fish and shellfish; and
- European otter.

Birds

4.2.5 Scotland, and its coastline, is important for marine and coastal birds, including seabirds, seaducks, divers, grebes, waders and waterfowl. Scotland provides an essential feeding station for migrating birds, a safe winter haven for ducks, geese and shorebirds, and provides nesting sites for seabird species. It holds internationally significant numbers of 24 species of breeding seabirds, with additional migratory species of waterbird overwintering on Scotland's coasts[81].

4.2.6 Seabirds respond to a range of factors, such as changes in food availability, weather, predation and pollution. Breeding abundance and productivity is assessed for a number of the

[81] Scottish Government, 2011, Scotland's Marine Atlas: Information for the National Marine Plan.

species that breed in Scotland based on a representative sample of colonies around Scotland, which are monitored as part of the UK Seabird Monitoring Programme[82]. Scotland's coastal breeding seabird population numbers are presented in Table 6.

Table 6: Scottish Coastal Breeding Seabird Populations

Species	Scottish Population[1]
Northern fulmar *Fulmarus glacialis*	485,852
Manx shearwater *Puffinus puffinus*	126,545
European storm-petrel *Hydrobates pelagicus*	21,370
Leach's storm-petrel *Oceanodroma leucorhoa*	48,047
Northern gannet[2] *Morus bassanus*	182,511
Great cormorant *Phalacrocorax carbo*	3,626
European shag *Phalacrocorax aristotelis*	21,487
Arctic skua *Stercorarius parasiticus*	2,136
Great skua *Catharacta skua*	9,634
Black-headed gull *Larus ridibundus*	6,888
Common gull *Larus canus*	20,467
Lesser black-backed gull *Larus fuscus*	21,565
Herring gull *Larus argentatus*	71,659
Great black-backed gull *Larus marinus*	14,773
Black-legged kittiwake *Rissa tridactyla*	282,213
Sandwich tern *Sterna sandvicensis*	1,068
Roseate tern[3] *Sterna dougallii*	5
Common tern *Sterna hirundo*	4,784
Arctic tern *Sterna paradisaea*	47,306
Little tern *Sterna albifrons*	331
Common guillemot[4] *Uria aalge*	1,167,841
Razorbill[5] *Alca torda*	139,186
Black guillemot *Cepphus grille*	37,505
Atlantic puffin *Fratercula arctica*	493,042

[1] Most figures are from the Seabird 2000 survey (1998-2002)[83] apart from Northern gannet and roseate tern which include more recent updates. All counts are of pairs unless otherwise stated.
[2] Northern gannet figures are from the complete UK and Ireland survey of colonies in 2003-2005[84].

[82] ibid

[83] P. Ian Mitchell, Stephen Newton, Norman Ratcliffe & Tim E. Dunn (2004) Seabird Populations of Britain and Ireland. Available at: http://jncc.defra.gov.uk/seabird2000, accessed 22/08/2018.

Species	Scottish Population[1]
[3] Roseate tern figures are from 2006[85]. [4] Counts are of individuals. [5] Counts of pre-breeding adults.	

4.2.7 Scotland hosts large numbers of wintering seaduck, divers and grebes. Seaducks undertake surface diving to capture molluscs such as mussels and clams as well as crustacea. Divers and grebes are piscivores, preying on a variety of small fish such as clupeids, sandeel and small gadoids by undertaking pursuit diving.

Table 7: Key areas for seaducks, divers and grebes in Scotland[86,87,88]

Species	Key areas
Red-throated Diver	West coast of the Outer Hebrides, Pentland Firth and Scapa Flow, North Orkney, Clyde Estuary, around Stranraer, Luce Bay, the outer Solway Firth, Shetland, Rum, East Mainland Coast, Fetlar, Moray Firth, Outer Firth of Forth and Tay Bay Complex.
Great Northern Diver	West coast of the Outer Hebrides (particularly in the Sounds of Barra, Monach and Harris), Pentland Firth and Scapa Flow, North Orkney, Sea of Hebrides, Coll and Tiree, Sound of Gigha, Loch Indaal, Wester Ross, Sky, Mull, Luce Bay, Broad Bay, Shetland, East Mainland Coast, Moray Firth.
Great Crested Grebe	Solway Firth, Forth Estuary.
Eider	West coast of the Outer Hebrides, Pentland Firth and Scapa Flow, North Orkney, Firth of Clyde, Outer Hebrides, Sea of Hebrides, Coll and Tiree, Shetland, East Mainland Coast, Sound of Gigha, Broad Bay, Moray Firth, Loch Ryan, Outer Firth of Forth and Tay Bay Complex.
Long-tailed Duck	West coast of the Outer Hebrides, Pentland Firth and Scapa Flow, North Orkney, Sound of Harris, Outer Hebrides, Uist, Barra, Broad Bay, Moray Basin, Moray Firth, Cromarty and Dornoch Firths, Shetland, East Mainland Coast, Outer Firth of Forth and Tay Bay Complex.
Common Scoter	Solway Firth, Moray Basin, Moray Firth, Cromarty and Dornoch Firths, Outer Firth of Forth and Tay Bay Complex.
Scaup	Solway Firth, Loch Indaal, Nith Estuary, Carsethorn, Loch Ryan, Moray Basin, Moray Firth, Cromarty and Dornoch Firths.

[84] Mavor, R.A., Parsons, M., Heubeck, M. and Schmitt, S. (2006) Seabird numbers and breeding success in Britain and Ireland, 2005. Peterborough, Joint Nature Conservation Committee. (UK Nature Conservation, No. 30.). Available at: http://jncc.defra.gov.uk/pdf/pub06_Seabird_numbers2005.pdf, accessed 22/08/2018.

[85] Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

[86] ibid.

[87] Austin, G.E., Calbrade, N.A., Mellan, H.J., Musgrove, A.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. and Holt, C.A. (2014). Waterbirds in the UK 2012/13: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report, accessed on 21/08/2018.

[88] DECC (2016). UK Offshore Energy Strategic Environmental Assessment. OESEA3 Environmental Report Future Leasing/Licensing for Offshore Renewable Energy, Offshore Oil & Gas, Hydrocarbon Gas and Carbon Dioxide Storage and Associated Infrastructure, March 2016. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/504827/OESEA3_Environmental_Report_Final.pdf, accessed 21/08/2018.

4.2.8 Important populations of other wintering and passage waterbirds are recorded in estuaries and sheltered coastal sites in Scotland (Table 8). Some of these sites lie on a major migratory flyway and in spring and autumn birds utilise the area as a staging post during onward migration to wintering grounds.

Table 8: Important sites for non-breeding waterbirds in Scotland[89,90]

Site	Species
Upper Solway Flats and Marshes	Whooper swan, pink-footed goose, barnacle goose (Svalbard population), shelduck, pintail, oystercatcher, ringed plover, knot, dunlin, redshank, teal, scaup, cormorant, golden plover, sanderling, ruff, black-tailed godwit, bar-tailed godwit, curlew, greenshank, turnstone
Loch of Inch and Torrs Warren	Greenland white-fronted goose
Dornoch Firth	Greylag goose, bar-tailed godwit, whooper swan, wigeon, teal, greenshank
Cromarty Firth	Greylag goose, bar-tailed godwit, wigeon, knot, redshank, whooper swan
Inner Moray/Inverness Firth	Pink-footed goose, greylag goose, Slavonian grebe (listed as Moray Firth only), whooper swan, wigeon, teal, pintail, oystercatcher, knot, bar-tailed godwit, curlew, redshank
Moray and Nairn Coast	Greylag goose, pink-footed goose, redshank
Loch of Strathbeg	Whooper swan, pink-footed goose, barnacle goose
Ythan Estuary, Sands of Forvie and Meikle Loch	Pink-footed goose, redshank, lapwing
Montrose Basin	Pink-footed goose, greylag goose, whooper swan, shelduck, wigeon, eider, red-breasted merganser, knot, greenshank, redshank
Forth Estuary	Pink-footed goose, greylag goose, knot, bar-tailed godwit, redshank, Shelduck, cormorant, oystercatcher, golden plover, knot, sanderling, dunlin, ruff, black-tailed godwit, curlew, greenshank, turnstone
Kintyre Goose Roost	Greenland white-fronted goose
Bridgend Flats, Islay	Barnacle goose
Lagan, Islay	Barnacle goose, Greenland white-fronted goose
Rinns of Islay	Whooper swan, Greenland white-fronted goose, common scoter
Gruinart Flats, Islay	Barnacle goose, Greenland white-fronted goose
Treshnish Isles	Barnacle goose
Coll	Barnacle goose

[89] Holt CA, Austin GE, Calbrade NA, Mellan HJ, Hearn RD, Stroud DA, Wotton SR & Musgrove AJ (2015) Waterbirds in the UK 2013/14: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford.

[90] JNCC website. Available at http://jncc.defra.gov.uk/page-2598, accessed 21/08/2018.

Site	Species
Shiant Islands	Barnacle goose
South Uist Machair and Lochs	Ringed plover, sanderling
Monach Islands	Barnacle goose
North Uist, Machair and Islands	Barnacle goose, purple sandpiper, ringed plover, turn-stone
North Sutherland Coastal Islands	Barnacle goose
Switha	Barnacle goose
East Sanday Coast	Bar-tailed godwit, purple sandpiper, turnstone

4.2.9 A total of 41 bird species have been identified as qualifying species found within the pSPAs, as described in Table 5. Of these, 11 are Annex I species classified under the Birds Directive which are in danger of extinction, vulnerable to specific changes in their habitat, considered rare because of small populations or restricted local distribution; or requiring particular attention for reasons of the specific nature of habitat[91].

Protected habitats and species

4.2.10 The importance of Scotland's marine ecosystems is reflected in the range of designations which protect them at the international and national levels. All designations are included and incorporated into Scotland's Marine Protected Area Network covering approximately 20% of Scottish seas. The current designations, graphically represented in Figure 4 are:

- Special Areas of Conservation (SAC): these include both inshore and offshore SAC and cover eleven different marine habitat types which occur in Scotland (sandbanks which are slightly covered by seawater all the time; estuaries; mudflats and sandflats not covered by seawater at low tide; coastal lagoons; large shallow inlets and bays; reefs; submarine structures made by leaking gases; and submerged or partially submerged sea caves). Seven marine species that occur in Scotland are also protected (bottlenose dolphin, harbour porpoise, grey seal, harbour seal, sea lamprey, Atlantic salmon and otter);
- Special Protection Areas (SPAs): these protect and are of international importance for a number of bird species (e.g. seabirds, waders, ducks and geese);
- Nature Conservation MPAs: these protect habitats and species such as maerl beds, coral gardens, and common skate; and

[91] European Commission, Bird species of Annex I of the Birds Directive [Online] Available at http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm, accessed 31/07/2018.

- Sites of Specific Scientific Interest (SSSI): these are nationally designated sites which protect species such as seabirds and seals, and habitats such as sea caves and rocky shores.

4.2.11 In addition, Ramsar sites are designated for their internationally important wetlands. Each Ramsar site is also designated as either a SPA or SAC, depending on the features present. These sites are shown in Figure 4.

4.2.12 Currently there are 18 MPAs designated for nature conservation purposes under the Marine (Scotland) Act 2010 and 37[92] SACs designated under the EU Habitats Directive located within territorial waters (i.e. within 12nm of the territorial baseline) (Figure 4). A further 13 MPAs and 11 SACs are designated in the offshore environment[93] (i.e. from 12nm from the territorial baseline, or within non-territorial waters).

4.2.13 There are 45 current SPAs, of which 31 are extensions to seabird colony SPAs designated under the EU Birds Directive to protect a range of vulnerable or migratory bird species and 61 SSSI for the further protection of species such as seabirds and seals and habitats ranging from sea caves and rocky shores[94]. There are also 51 Ramsar sites designated as internationally important wetlands, covering a total area of about 313,000 hectares[95].

4.2.14 The Habitats Directive also affords protection to certain species of plants and animals (European Protected Species). In the marine environment these include cetaceans, basking sharks and seals.

Priority marine features

4.2.15 In July 2014, Scottish Ministers adopted a list of 81 PMFs. PMFs are species and habitats which have been identified as being of conservation importance to Scotland[96]. Most are a subset of species and habitats identified on national, UK or

[92] Scottish Government (2018) Marine Protected Areas (MPAs) [online] Available at: http://www.gov.scot/Topics/marine/marine-environment/mpanetwork (accessed 22/01/2018)

[93] Scottish Government (2018) Developing Fisheries Management Proposals for Offshore Special Areas of Conservation (SACs) and Marine Protected Areas (MPAs) Under the Common Fisheries Policy (CFP) [online] Available at: http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/SACmanagement (accessed 22/01/2018)

[94] Scottish Government (2018) Marine Protected Areas (MPAs) [online] Available at: http://www.gov.scot/Topics/marine/marine-environment/mpanetwork (accessed 22/01/2018)

[95] SNH (2018) Ramsar Sites [online] Available at: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/international-designations/ramsar-sites (accessed 19/11/2018)

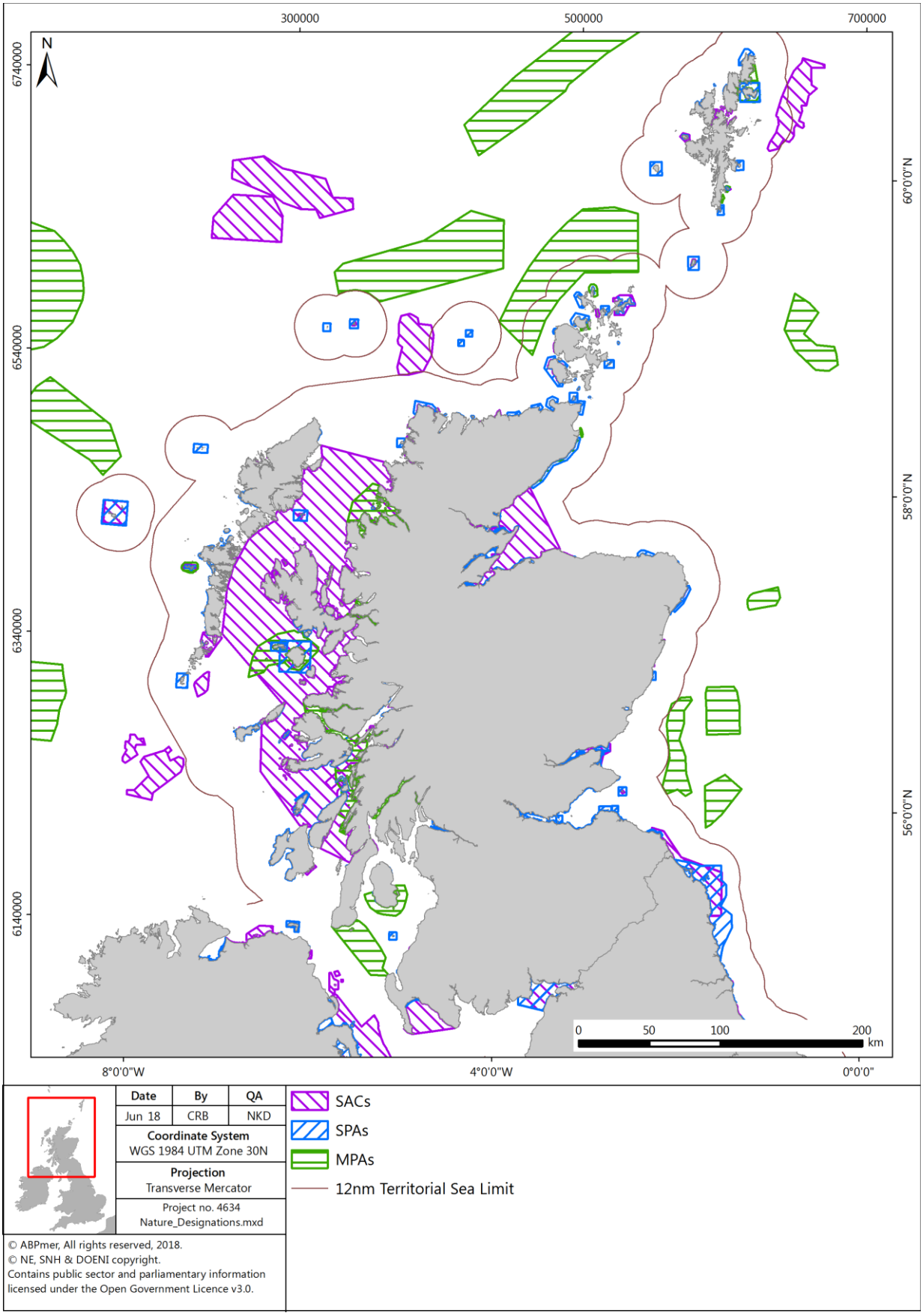
[96] Scottish Natural Heritage, 2018. Priority marine features in Scotland's seas. [online] Available at: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/priority-marine-features-scotlands-seas (accessed 02/05/2018)

international lists. The National Marine Plan includes a policy (GEN 9 Natural Heritage) for safeguarding PMFs whereby "*Development and use of the marine environment must not result in significant impact on the national status of PMFs*" [97].

4.2.16 The list of 81 PMFs comprise 26 broad habitats (e.g. burrowed mud), seven low or limited mobility species (e.g. ocean quahog), and 48 mobile species, including fish (e.g. blue ling) and marine mammals (e.g. minke whale).

[97] The Scottish Government, 2015. Scotland's National Marine Plan. A single framework for managing our seas. [online] Available at: http://www.gov.scot/Publications/2015/03/6517/5 (02/05/2018)

Figure 4 Scotland's marine nature conservation designations



Trends and pressures

4.2.17 Scotland's Marine Atlas presented an assessment of the condition of Scotland's seas and a summary of significant pressures and the impacts of human activity[98]. It was based on scientific evidence from available data and analysis, supported by expert judgement and taking account of key data gaps[99].

4.2.18 The Marine Atlas reviewed the condition of the five major seabed habitat types in Scottish waters. There were few or no concerns about subtidal rock. Intertidal rock and sediments show evidence of deterioration, with one concern being the introduction of non-native invasive species such as wireweed (*Sargassum muticum*), a brown alga. The most significant level of concern related to the condition of shallow and shelf subtidal sediments, mainly as a result of fishing practices such as demersal fishing (trawling) and scallop dredging. There were also some concerns about the effects of trawling on deep sea habitat.

4.2.19 The Marine Atlas also assessed the condition of the following species: plankton, cetaceans, grey seals, harbour seals, seabirds, demersal fish, sharks/rays and water birds.

4.2.20 Scotland's Marine Atlas reported that seabird populations are increasing in some areas (Solway Firth and the Firth of Clyde, for example) and decreasing in others for certain species. In East and West Shetland and along the North Scotland coast, this decrease is most probably related to a shortage of prey species resulting from changes in oceanographic conditions. Like seabirds, waterbirds (wildfowl and waders) are also both increasing and decreasing year on year, depending on the species and location[100]. The reasons for the declines remain to be fully explained but may in part be due to redistribution of wintering birds across northwest Europe due to climate change effects.

4.2.21 A more recent assessment of seabird trends between 1986 and 2016 found that the mean numbers of 12 species of breeding seabirds in Scotland have declined by 62% compared to the

[98] Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

[99] Marine Scotland (2013) Marine Atlas Data Sources: General & Overall Assessment. Available at: http://www.gov.scot/Topics/marine/science/atlas/Annexes/Data (accessed 14/06/2018)

[100] Teresa M. Frost, Graham E. Austin, Neil A. Calbrade, Heidi J. Mellan, Richard D. Hearn, David A. Stroud, Simon R. Wotton and Dawn E. Balmer. (2018) Waterbirds in the UK 2016/17: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford.

1986 baseline level[101]. Out of the 12 species assessed for breeding numbers, Arctic skua has experienced the largest declines (77%). The Northern Isles are their key breeding area and there have been declines in the availability of sandeels, which they obtain from other seabirds, such as kittiwake, by chasing them to make them release their food. Similar patterns of declines have occurred for the species they parasitise, particularly kittiwakes and terns. Increased predation from great skua has also been linked to their decline[102]. Some species trends, although lower, appear to be stabilising possibly at a new level which differs from the 1986 baseline. Numbers of common terns increased in 2016, which may reflect a rapid response to favourable breeding conditions.

4.2.22 This assessment found that seabird breeding productivity between 1986 and 2016 varied for the 12 species analysed[103]. Breeding success was above the long-term average for Arctic tern; black-legged kittiwake; common tern; little tern; northern gannet and Sandwich tern. Great skua and herring gull had lower breeding success. All other species were around the long-term average.

4.2.23 There has also been a general decline in harbour seal numbers since 2001 in several regions of the north and east of Scotland, in particular in Orkney and the Firth of Tay[104,105]. However, the patterns of decline are not universal. For example, the Moray Firth harbour seal count declined prior to 2005, remained relatively stable for four years, then increased by 40% in 2010 and has fluctuated ever since, showing no significant trend since 2000[106]. However, it is noted that bycatch of harbour

[101] Scottish Natural Heritage (2018) Biodiversity Indicator. The numbers and breeding success of seabirds. Available at: https://www.nature.scot/sites/default/files/2018-07/Scottish%20Biodiversity%20Indicator%20S005%20-%20Abundance%20of%20Breeding%20Seabirds%201986%20-%202016.pdf (accessed 24/07/2018).

[102] Meek, E.R., Bolton, M., Fox, D. and Remp, J. (2011) Breeding skuas in Orkney: a 2010 census indicates density-dependent population change driven by both food supply and predation. Seabird, 24, 1-10.

[103] Scottish Natural Heritage (2018) Biodiversity Indicator. The numbers and breeding success of seabirds. Available at: https://www.nature.scot/sites/default/files/2018-07/Scottish%20Biodiversity%20Indicator%20S005%20-%20Abundance%20of%20Breeding%20Seabirds%201986%20-%202016.pdf (accessed 24/07/2018).

[104] Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

[105] Arso Civil, M., Smout, S., Thompson, D., Brownlow, A., Davison, N., Doeschate, M., Duck, C., Morris, C., Cummings, C., McConnell, B. and Hall, A. J. (2018) Harbour Seal Decline – vital rates and drivers. Report to Scottish Government HSD2.

[106] SCOS (2017) Scientific Advice on Matters Related to the Management of Seal Populations: 2017. Available at: http://www.smru.st-andrews.ac.uk/files/2018/01/SCOS-2017.pdf (accessed 15/06/2018)

seals has been reported in the static net fishery in recent years[107].

4.2.24 The Marine Atlas also noted that populations of many commercial fish species are declining and that this is of particular concern in the Solway Firth, North Channel, Firth of Clyde, Minches and Malin Sea, North Scotland coast and West Shetland. Several commercial fish stocks were being fished above levels consistent with achieving maximum sustainable yield (MSY) in 2011, including northeast Atlantic mackerel, herring (west of Scotland), cod (North Sea and west of Scotland stocks), blue whiting, saithe and monkfish.

4.2.25 When the seven commercial fish stocks were reassessed in 2017, five of the stocks mentioned above were fished below the MSY, showing an improvement in the sustainability of those fisheries. However, both of the cod stocks (North Sea and west of Scotland) were still being fished above the MSY[108].

4.2.26 Box 1 sets out some of the key current and future pressures on marine biodiversity, flora and fauna. The Feature Activity Sensitivity Tool (FEAST) provides more comprehensive information on the relevant pressures associated with a range of marine activities and the sensitivity of MPA protected features to these activities and pressures[109].

Box 1 Pressures on marine biodiversity, flora and fauna

Commercial fishing:

- Removal of target fish species may affect the sustainability of fish stocks, particularly where catches are above the level consistent with achieving maximum sustainable yield;
- Discards of fish are a waste of the resource, and also encourage scavenger species;
- Bycatch inadvertently catches both non-target fish and other species, generally leading to the death of individuals and subsequent decline in populations;
- The seabed and its benthic habitat may be damaged by mobile fishing gear, with the consequent loss of marine plants and animals; and
- Removal of target species may also decrease the availability of prey species, leading to declines in populations of other species (e.g. birds).

Non-native invasive species:

- May outcompete native species, thereby displacing them from the marine environment.

Marine litter:

- Can result in the injury and/or death of marine animals through entanglement, ingestion of

[107] Northridge, S., Kingston, A., Mackay, A. and Lonergan, M. (2011) Bycatch of Vulnerable Species: Understanding the Process and Mitigating the Impacts. Final Report to Defra Marine and Fisheries Science Unit, Project no F1003. University of St Andrews. Defra, London, 99pp.

[108] ICES Stock Assessment Graphs (2018) [online] Available at: http://standardgraphs.ices.dk/stockList.aspx (accessed 22/01/2018)

[109] The Scottish Government (2013) FEAST – Feature Activity Sensitivity Tool. [online] Available at: http://www.marine.scotland.gov.uk/feast/ (accessed 02/05/18)

litter (including plastic microparticles in particular), or both.

Navigation dredging:

- Can result in loss of and/or damage to the seabed and the habitat that it supports, increasing pressure on biodiversity using that habitat and therefore potentially decreasing the availability of prey species, leading to declines in populations e.g. of birds;
- May give rise to suspended sediments, resulting in decreased water quality, reduced visibility for foraging fauna and/or smothering of the seabed if these sediments settle out in a different area; and
- May disturb marine animals, including through increased noise levels.

Marine transport:

- Risk of collision of vessels with marine animals, resulting in their injury and/or death, with subsequent population declines;
- May result in increased coastal erosion through the action of vessel wakes; and
- Vessel noise can impact marine animal behaviour and result in disturbance and / or displacement, including displacement of bird species from the water.

Aquaculture:

- May give rise to elevated nutrient levels in and on the seabed from fish faeces and excess animal feed, which can result in changes to community composition and/or smothering of the seabed;
- Nets associated with aquaculture can result in the injury and / or death of marine animals through entanglement;
- Can damage the seabed and its habitat through anchoring of infrastructure; and
- May affect wild salmon through transmission of sea lice.

Marine wildlife watching:

- May result in increased disturbance and displacement to populations of marine animals such as whales, dolphins and bird species.

Recreation:

- May result in loss of and/or damage to the seabed and its habitat through anchoring
- May give rise to increased levels of marine litter; and
- May disturb marine animals if the Scottish Marine Wildlife Watching Code is not adhered to through human and/or vessel presence.

Offshore renewables:

- May result in loss of and/or damage to the seabed and its habitat, through anchoring of infrastructure;
- Give rise to collision risk (e.g. with birds, mammals, etc.); and
- Result in changes to sediment transport through changes in energy levels in the water.

Climate change (increasing sea temperatures, acidification, changes to rainfall patterns, increased extreme weather events etc.):

- May result in populations of marine animals and plants moving further north;
- May result in increased levels of seabird mortality (including large scale events such as seabird wrecks), due to increased levels of extreme weather events;
- May give rise to population decline; and
- May result in new competitors arriving in Scottish waters, including non-native invasive species.

4.3 Geodiversity

Seafloor geodiversity

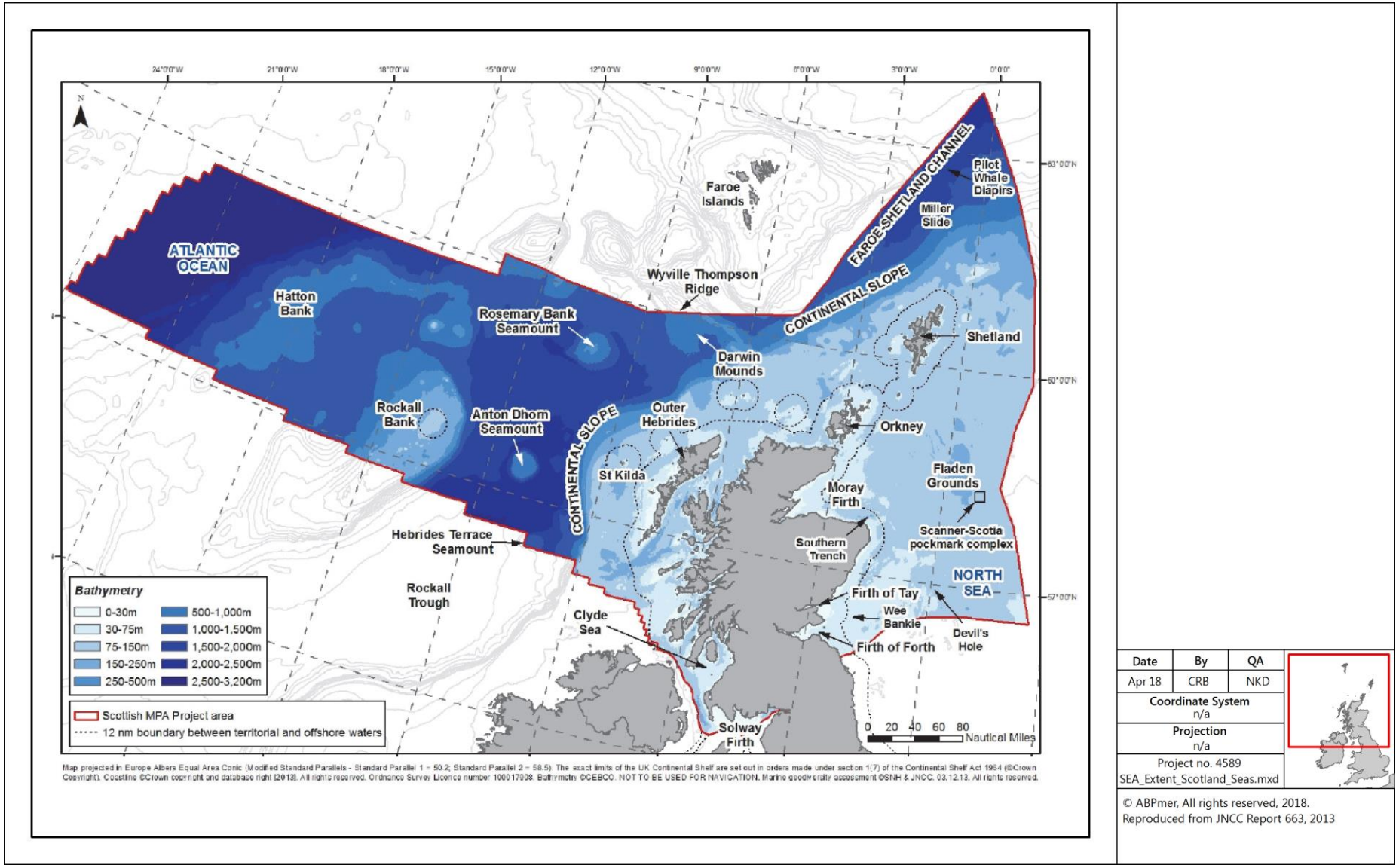
4.3.1 Geodiversity is defined as the natural range (diversity) of geological features (rocks, minerals, fossils, and structures), geomorphological features (landforms and processes) and soil features that make up the landscape both on land and below water. The condition of underlying geodiversity features such as sand banks and seabed influence the quality of habitats which in turn affects the viability and health of both flora and fauna populations.

4.3.2 There are six protected features of Scottish geodiversity:

- Quaternary of Scotland;
- Submarine Mass Movement;
- Marine Geomorphology of the Scottish Deep Ocean Seabed;
- Seabed Fluid and Gas Seep;
- Cenozoic Structures of the Atlantic Margin; and
- Marine Geomorphology of the Scottish Shelf Seabed.

4.3.3 Each feature is in turn comprised of a variety of components, such as continental slope channels, iceberg ploughmark fields, moraines, slide deposits, sand wave fields, pockmarks, seamounts, sand banks and mega-scale glacial lineation. Major physiographical features of the Scottish marine environment are shown in Figure 5.

Figure 5 Extent of Scotland's seas, showing bathymetry and locations of major physiographical features



4.3.4 Scottish waters are geomorphologically distinct between the east and west coasts. The east coast presents mostly uniform depths and shallow inclines interspersed with localised trenches, while the seabed off Scotland's west coast shelves steeply away from the coast, and deep waters occur relatively close to the land.

4.3.5 Data from the British Geological Society (BGS) demonstrates that Scottish waters display a wide range of seabed habitats, ranging from scoured rock or coarse sediment to muddy gravel or fine sand in some areas. A description of the key habitat types in Scottish waters is provided in Paragraphs 4.2.2 to 4.2.3.

4.3.6 In general, marine sediments are sandy or gravelly and originate from deposits from the Quaternary glaciation. Muddy sediments occur principally nearshore or, further offshore, in depressions on the sea floor, where currents may be relatively weak. They also occur beyond the shelf break (200 m water depth) to the west of Scotland. The concentration of calcareous material varies greatly in seabed sediments, reflecting the amount of shell material in different areas; locally, it can be very high[110] (Figure 6).

Coastal geodiversity

4.3.7 Much of Scotland's landscape and coastline was initially formed through the processes of glacial erosion and deposition. Today the coast continues to change as a result of coastal processes such as wave action, sediment movement, erosion and accretion. The 2004 Eurosion survey of Scotland's coastline reported that it comprises predominantly hard coasts of rocks and cliffs (70%); soft coasts that are potentially susceptible to erosion impacts, consisting of unconsolidated gravels, sand and silts (29%); and artificial coasts such as harbours and sea walls (less than 1%) (Figure 7).

Trends and pressures

4.3.8 Coasts are dynamic environments, continually changing in response to variations in weather, land use and the supply of sediment. This capacity for change encourages landholders to try to design schemes to restrict and control this natural dynamism. Restricting coasts affects water and sediment flows, which can destroy wildlife habitat and reduce landscape value

[110] Taken from Marine Scotland (2008) Scotland's Seas: Towards Understanding their State, Chapter 2.

and diversity. Intervention at one point on a coastline can have a negative knock-on effect at another point in this dynamic landscape.

4.3.9 Pressures on geodiversity features in Scottish seas arise from multiple activities, including renewable energy scheme development, seafloor exploration activities and fishing[111].

[111] SNH (2013) Assessing the sensitivity of geodiversity features in Scotland's seas to pressures associated with human activities. Report 590. Available at: http://www.snh.org.uk/pdfs/publications/commissioned_reports/590.pdf

Figure 6 Scotland's marine sediments

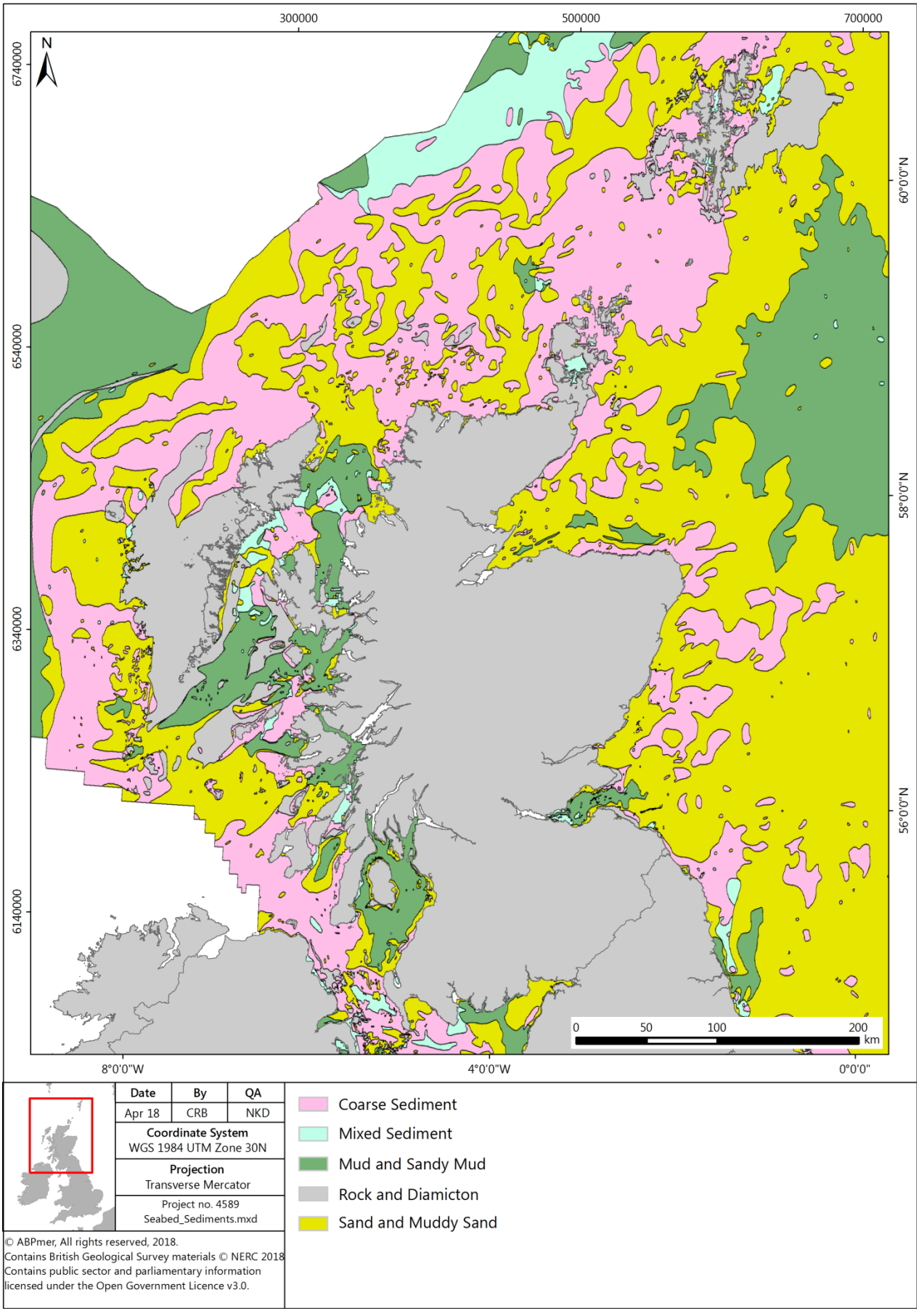
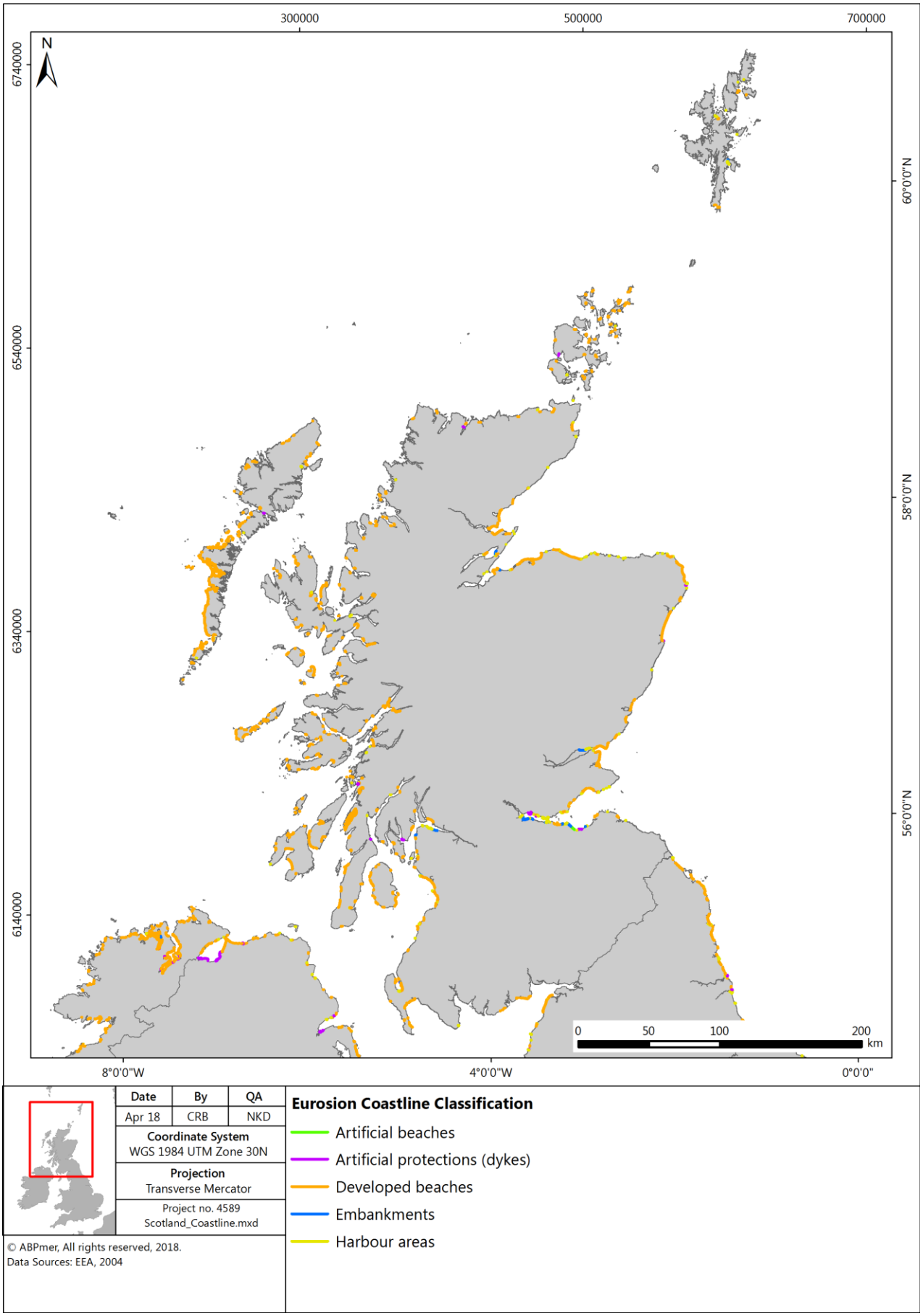


Figure 7 Scotland's coastline



4.4 Ecological status of water bodies

4.4.1 There are various mechanisms in place for monitoring and managing the quality of Scottish waters. Each takes a different focus and approach:

- The Water Framework Directive (WFD) establishes a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater, with the aim of ensuring that all aquatic ecosystems meet 'good status';
- River Basin Management Plans (RBMPs) have been prepared for the Scotland and Solway Tweed River Basin Districts to address the requirements of the WFD in relation to the management of Scotland's river systems. Both plans also provide an overview of the state of the water environment for their districts. The plans have been updated since the first cycle (2009 – 2015) and are currently in the second cycle (2015 – 2027); and
- Scotland's coastal waters are monitored by the Scottish Environment Protection Agency (SEPA) to measure performance and compliance with targets for coastal water quality status under the WFD.

4.4.2 Coastal and transitional water bodies are classified in terms of their ecological and chemical quality. For those water bodies not designated as heavily modified or artificial, this ecological quality is described in terms of 'ecological status', which defines how much ecological quality deviates from natural conditions. The quality elements used to assess ecological status are:

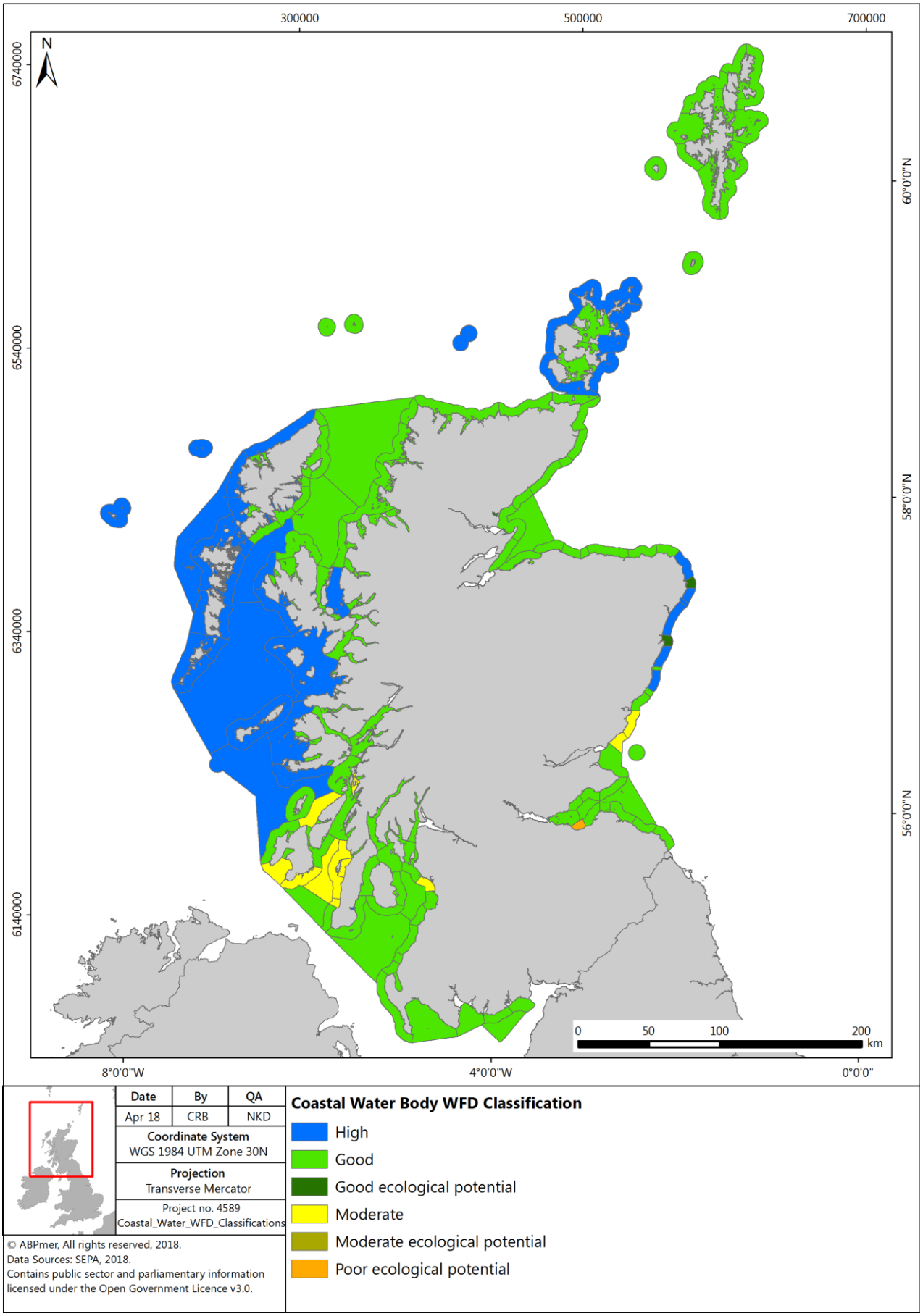
- Biological quality elements (water, plants and animals);
- Chemical and physicochemical elements (e.g. oxygen and nutrient levels); and
- Hydromorphological quality elements (water flows and levels; the condition of beds, banks and shores; and the continuity of rivers for fish migration).

4.4.3 For good status, the chemical, physicochemical and hydromorphological quality of the water body must achieve the standards and conditions necessary for the biological quality elements to be in good condition. The ecological status of a water body is determined by the lowest-classed quality element.

4.4.4 Scotland's coastal and transitional water bodies are mostly classed as being of 'high' or 'good' ecological status under the WFD as part of the latest assessment in 2016 (Figure 8). Specifically, this assessment found 99.5% of coastal waters in good or better condition (143 high, 312 good, 1 moderate, and 1 poor) and 86% of estuaries in good or better condition (12

high, 29 good, and 7 moderate). There is a small area in the Firth of Forth that is classified as poor, specifically the Leith Docks to Port Seton coastal water body (Figure 8).

Figure 8 Coastal waters WFD classification in 2016



4.4.5 Since the first RBMPs in Scotland were published in 2009, the condition of water bodies has generally improved. However, a wide range of pressures are continuing to impact on the condition of specific water bodies and protected areas. The most widespread pressures on the water environment in the Scotland RBMP are man-made barriers to fish migration, modifications to physical condition, rural diffuse pollution, waste water discharges and hydroelectricity generation[112]. The main reasons for water bodies in the Solway Tweed RBMP not being in good condition are water quality, man-made barriers to fish movement, physical condition, changes in water flows and levels, and damage from non-native plants or animals[113].

4.5 Climatic factors (including carbon cycling, storage and sequestration)

4.5.1 The term ‘carbon cycle’ refers to the circulation of carbon in the environment, in the context of this report if focusses on the exchange of carbon between the ocean and the atmosphere. The proportion of carbon incorporated into biomass is said to be ‘stored’; thus, marine ecosystems such as kelp forests, maerl beds and marine sediments are able to store carbon. The addition of solid carbon to these long-term stocks is referred to as sequestration, and the conversion of carbon dioxide to solid carbon in living material is referred to as fixation. The stored carbon is removed from the environment; however, physical disturbance, mortality or respiratory processes following predation may release the stored carbon back into the environment.

4.5.2 Over half of global carbon sequestration occurs through fixation during oceanic photosynthesis and long-term storage of produced dead material. In addition to carbon being sequestered within the oceanic seabed, a significant stock is stored within living marine organisms. These organisms include taxa that possess calcium carbonate skeletons and shells such as coral and molluscs, with other carbon captured and stored in

[112] Scottish Government. 2015. The river basin management plan for the Scotland river basin district: 2015–2027. https://www.sepa.org.uk/media/163445/the-river-basin-management-plan-for-the-scotland-river-basin-district-2015-2027.pdf (accessed 02/02/2018).

[113] Scottish Government. 2015. The river basin management plan for the Solway Tweed river basin district: 2015 update. https://www.sepa.org.uk/media/218890/rbmp_solway_tweed_2015.pdf (accessed 02/02/2018).

plant dominated habitats such as seagrass beds, kelp forests and maerl.

4.5.3 Multiple habitats across Scottish seas and coastal areas can be termed 'blue carbon sinks' due to their fixation and sequestration ability. Their effectiveness as carbon sinks is highly dependent upon their long-term capacity to store carbon. Habitats present in Scottish waters and classed as blue carbon sinks are[114]:

- Kelp forests;
- Intertidal and sub-canopy macroalgae;
- Saltmarshes;
- Seagrass beds;
- Maerl beds;
- Biogenic reefs;
- Horse mussel (*Modiolus modiolus*);
- Flame shell (*Limaria hians*);
- *Lophelia pertusa* reef;
- Tubeworm (*Serpula vermicularis*) reef;
- Blue mussel (*Mytilus edulis*);
- *Sabellaria* reefs.
- Brittlestar beds;
- Sediment; and
- Phytoplankton.

4.5.4 The largest contribution to carbon fixation and sequestration in Scottish waters comes from phytoplankton, via photosynthesis. Carbon stored in shallow shelf sediment is ephemeral and constantly exchanged due to the dynamic nature of this habitat. Despite this, it is still considered the second largest store of carbon. Deeper sediments are less mobile and dynamic and therefore are able to store carbon to a greater extent, but the rate of uptake is longer as sedimentation rates are reduced. The fourth largest store is considered to be within kelp forests, which are ubiquitous along the rocky shore common around Scotland.

4.5.5 Several of the other habitats listed are more efficient at carbon fixation and sequester a larger proportion of carbon as compared to their physical extent, but as their total extent

[114] Burrows, M.T., Hughes, D.J., Austin, W.E.N., Smeaton, C., Hicks, N., Howe, J.A., Allen, C., Taylor, P. & Vare, L.L. 2017. Assessment of Blue Carbon Resources in Scotland's Inshore Marine Protected Area Network. Scottish Natural Heritage Commissioned Report No. 957.

across Scotland is low, they do not affect the whole of the Scottish estimate.

Trends and pressures

4.5.6 Climate change has the potential to affect the carbon sequestration capacity of marine habitats. Kelps and seagrasses are likely to be vulnerable to increases in the occurrence of severe storms which have the potential to cause physical damage and reduce carbon storage. For seagrasses, reductions in canopy density resulting from physical damage may also decrease this habitat's ability to trap sediment and deflect wave energy away from the bed. Carbon-storing sediments are therefore likely to be more vulnerable to wave scour and subsequent resuspension during severe storms. Such storm events are also likely to increase the turbidity of the water, through increased sediment input, which could potentially affect growth rates and therefore the overall carbon sequestration capacity of marine habitats.

4.5.7 Several methods of fishing physically disturb the seafloor. As previously stated, any physical damage caused to a habitat has the potential to disturb, remove or release any carbon held within that store. The level of impact will depend on the specific area affected. For example, the trawling of ephemeral, gravelly areas will release negligible amounts of carbon, but a trawl through a kelp forest has potentially larger implications. In general, direct pressure from fishing activity has the potential to affect how Scotland's marine environments regulate atmospheric carbon levels.

4.5.8 Shelf seas around the UK are predicted to be 1.5°C to 4°C warmer by the end of the 21st century[115]. Warmer sea temperatures could result in a shift in distribution of certain habitats and species. Climate change may also favour some species, leading to a potential increase in the diversity of seabed marine life[116].

[115] UKCIP (2010) UK Climate Projections science report: Climate change projections. Available at: http://ukclimateprojections.metoffice.gov.uk/media.jsp?mediaid=87893&filetype=pdf (accessed 25/01/2018)

[116] SNH and The Marine Biological Association (undated) Impacts of climate change on seabed wildlife in Scotland [online] Available at: www.marlin.ac.uk/PDF/Climate_change_brochure.pdf (accessed 25/01/2018)

4.6 Future trends in marine industry

4.6.1 Within the marine environment it is expected that pressures associated with industry have the potential to increase or decrease, depending on larger scale trends within that industry.

4.6.2 Where marine industry activities require licencing, the classification of the pSPAs increases the protection afforded to the qualifying features through increased assessment requirements under the Habitats Regulations.

4.6.3 Within the scope of this SEA, this applies principally to aquaculture and marine renewables, both of which have aspirations to expand in Scottish waters within the foreseeable future.

Aquaculture

4.6.4 Under the Aquaculture Growth Strategy[117] the industry aims, supported by the Scottish Government[118], to double the economic contribution of the sector by 2030.

4.6.5 In order to achieve this goal there will be a requirement to increase the number of aquaculture farms within Scottish waters, and therefore a respective increase in the number of licence applications for aquaculture farm developments, potentially within the pSPA sites.

4.6.6 The development of additional aquaculture sites has the potential to introduce or increase pressure on the receptors identified above, as described in Box 1.

Renewable energy

4.6.7 Scottish seas have a high potential for the development of renewable energy, within the wave energy, tidal stream energy and more developed offshore wind sectors.

4.6.8 As a result, a number of projects have already been consented for development within coastal waters, and the draft plans for wind[119], wave[120] and tidal[121] energy development identify future

[117] Scotland Food & Drink, Aquaculture Growth to 2030, 2016 [online] Available at: http://scottishsalmon.co.uk/wp-content/uploads/2016/10/aquaculture-growth-to-2030.pdf (accessed 30/07/2018)

[118] Scottish Government Aquaculture Website, [online] Available at https://www.gov.scot/Topics/marine/Fish-Shellfish (accessed 30/07/2018)

[119] Scottish Government; Sectoral Marine Plan for Offshore Wind Energy (encompassing Deep Water Plan Options) – Context Report, June 2018, ISBN 9781788519595.

[120] Scottish Government, Wave Energy in Scottish Waters, Initial Plan Framework, May 2013.

[121] Scottish Government, Tidal Energy in Scottish Waters, Initial Plan Framework, May 2013.

opportunities for expansion. Marine Scotland are currently in the early planning stages for a new sectoral marine plan for offshore wind energy, details of which can be found here: https://www.gov.scot/Resource/0053/00536630.pdf

4.6.9 An increase in applications for the development of new infrastructure within Scottish waters could be expected, potentially within pSPA sites where there is appropriate renewable energy resource available to be exploited.

4.6.10 The development of additional renewable energy infrastructure has the potential to introduce or increase pressure on the receptors identified above, as described in Box 1.

5 Results of SEA

5.1 Environmental effects

5.1.1 The key potential environmental effects that could arise from the classification of the pSPA sites are as follows:

- Potential benefits to qualifying features in pSPAs by minimising or avoiding specific activities and pressures that currently or might in the future occur within these sites;
- Potential spillover benefits beyond pSPA site boundaries;
- Potential adverse environmental effects on areas outwith the pSPAs resulting from the displacement of activities and the intensification of activities in areas where they already occur; and
- Potential environmental impact of increased levels of activity that might not be targeted by the recommended management advice for pSPAs.

5.1.2 The increased protection that will result from the classification of the 15 pSPAs will provide potential environmental benefits for the overarching topic 'biodiversity, flora and fauna' and contribute to the achievement of the SEA objectives (Table 9).

Table 9: Impact on SEA objectives

SEA topic	SEA objective	Met/ not met	Rationale
Biodiversity, Flora, and Fauna	To safeguard marine and coastal ecosystems, including species and habitats, and their interactions	Yes	Protection of bird populations and benthic feeding grounds could contribute to the achievement of this objective by minimising or avoiding the disturbance and/or damage of marine species and habitats.
	To avoid pollution of the coastal and marine water environment	Yes	Protection of benthic feeding grounds could contribute to the achievement of this objective by reducing disturbance of the seabed and potential for increased suspended sediment levels and sediment-bound contaminants in the water column.
Soil	To maintain and protect the character and integrity of the seabed including avoidance of pollution of the seabed strata/seabed sediments	Yes	Protection of benthic feeding grounds could contribute to the achievement of this objective by reducing or preventing destruction of the seafloor, and also the potential for disturbance and re-settling of sediment-bound contaminants.
Water	To maintain or work towards achieving good eco-	Yes	Protection of benthic feeding grounds could contribute to the

SEA topic	SEA objective	Met/ not met	Rationale
	logical status		achievement of this objective by minimising or avoiding pressures that could result in a change to quality elements used to assess ecological status under the WFD.
Climatic Factors	To preserve and enhance existing marine carbon stocks and carbon sequestration potential	Yes	Protection of areas that include habitats that are Blue Carbon Sinks due to their fixation and sequestration ability could contribute to the achievement of this objective by reducing or preventing destruction of these habitats.

5.1.3 Habitats Regulations Appraisals (HRAs) that are undertaken for regulated activities are required to consider the likely significant effects of a project on the qualifying features of sites that are currently classified and also sites that are in the process of being classified (i.e. pSPAs). The classification of the pSPAs will provide greater clarity and confidence to developers providing the evidence in support of HRAs for future developments. This is particularly the case for pSPAs with qualifying features that are not currently protected (e.g. overwintering birds and breeding red-throated diver). There may also be marginal environmental benefits for foraging seabird qualifying features of pSPAs, where these bird colonies are already protected by existing SPAs.

5.1.4 Additional assessment requirements under the Habitats Regulations may potentially reduce pressures associated with regulated activities within the pSPAs, in particular aquaculture or marine renewables (see Section 4.6). Developers may look to avoid progressing consented developments that have not been built and locating regulated activities within pSPAs as they require further assessment and the consideration of appropriate mitigation measures. The avoidance of these sites by potentially harmful activities would therefore result in future environmental benefits within pSPAs.

5.1.5 In addition to the potential benefits afforded by the classification of the sites described above, the manner in which the sites are managed to ensure that the conservation objectives for the qualifying features are achieved has the potential to result in significant environmental changes. If some or all of the recommended options for management in the 'Advice to Support Management' documents were subsequently implemented (see Table 2), these have the potential to result in

beneficial effects on the overarching topic 'biodiversity, flora and fauna' and contribute to the achievement of the SEA objectives where these target specific activities and pressures that currently, or might in the future, occur within the pSPAs. In turn, these may also result in the potential for marginal spillover benefits beyond pSPA site boundaries. For example, avoiding certain harmful activities in sensitive areas may result in the potential spillover of species from protected areas into unprotected areas if there is a population surplus and the carrying capacity of the protected area is surpassed[122,123].

5.1.6 The implementation of some or all of the recommended options for management may also result in the potential displacement of an activity and its associated pressures outwith the boundaries of the pSPA resulting in potential adverse environmental effects in other areas, where such activities are not managed. It is also possible that the recommended options for management could result in increased levels of non-targeted activities within pSPAs. For example, removal of mobile fishing gear effort could facilitate greater use of some static gears. In circumstances where static gears such as pots or traps replace mobile demersal fishing gears or set nets, the potential adverse effects on birds and their habitats are likely to be reduced.

5.1.7 However, at present the range and scale of management measures that may or may not be implemented at each pSPA is not known and therefore it is not possible to determine with any level of certainty how future activities might be affected. The significance of any changes to future activities has therefore not been possible to assess.

5.2 Reasonable alternatives

5.2.1 The potential environmental effects associated with the reasonable alternatives (medium and lower scenarios) that have been developed for each of the sites (Section 3.5) are set out in detail in Table 10 below.

5.2.2 For the majority of sites, there is no anticipated change to the potential environmental effects that would occur under the high, medium or low scenarios. This is because the classification of sites and the potential recommended management advice that

[122] Buxton, C.D., Hartmann, K., Kearney, R. and Gardner, C., 2014. When is spillover from marine reserves likely to benefit fisheries?. PloS One, 9(9), p.e107032.

[123] Kerwath, S.E., Winker, H., Götz, A. and Attwood, C.G., 2013. Marine protected area improves yield without disadvantaging fishers. Nature Communications, 4, p.2347.

might apply at each of the sites are likely to remain the same across all scenarios, despite a reduction in the number of qualifying features under the medium and low scenarios. The only exception to this is Bluemull and Colgrave Sounds pSPA which under the low scenario would not be classified. Under this low scenario, there would no longer be protection afforded to this site and therefore a potential for adverse impacts to occur compared to the baseline situation.

Table 10 Assessment of medium and low scenarios

Site name	Medium scenario	Low scenario
Bluemull and Colgrave Sounds	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Removal of a single qualifying feature which would result in this site not being taken forward for classification. There would therefore no longer be protection afforded to this site and a potential for adverse impacts compared to the baseline.
Coll and Tiree	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
East Mainland Coast, Shetland	Reduction in the number of qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
Moray Firth	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
North Orkney	Reduction in the number of qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
Rum	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
Scapa Flow	Reduction in the number of qualifying	Further reduction in the number of

Site name	Medium scenario	Low scenario
	features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	qualifying features included in the citation in comparison to the medium scenario. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.
Sound of Gigha	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Reduction in the number of qualifying features included in the citation in comparison to the medium and high scenarios. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.
West Coast Outer Hebrides	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
Ythan Estuary, Sands of Forvie & Meikle Loch	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
Outer Firth of Forth & St Andrews Bay Complex	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
Pentland Firth	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Reduction in the number of qualifying features included in the citation in comparison to the medium and high scenarios. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.
Seas off Foula	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.

Site name	Medium scenario	Low scenario
Seas off St Kilda	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.
Solway Firth	No variation in qualifying features included in the citation. The recommended management advice options remain the same and therefore as for the high scenario, there is potential for beneficial impacts.	Low scenario is the same as medium scenario.

5.3 Mitigation and monitoring

5.3.1 No significant adverse environmental effects have been identified by the SEA and therefore no mitigation or monitoring measures are proposed as part of the assessment process. Any specific management measures that are subsequently developed at each pSPA will be subject to a separate SEA. This will include consideration of appropriate mitigation measures and monitoring proposals for any significant adverse effects, as well as potential enhancement of beneficial effects.

5.4 Cumulative effects

5.4.1 There will be beneficial cumulative effects from the classification and management of all the pSPAs as a greater proportion of the national population of a range of qualifying features will be protected across their biogeographic range which in turn will provide greater resilience to human pressures. This extends to cross-boundary benefits as a number of the qualifying features use other jurisdictions in some seasons.

5.4.2 There may also be significant cumulative benefits for overwintering birds and inshore assemblages that move between SPAs as the pSPAs have the potential to improve the potential connectivity between protected areas for these features[124,125,126]. The potential cumulative benefits of improving

[124] Mazaris AD, Papanikolaou AD, Barbet-Massin M, Kallimanis AS, Jiguet F, Schmeller DS, et al. (2013) Evaluating the Connectivity of a Protected Areas' Network under the Prism of Global Change: The Efficiency of the European Natura 2000 Network for Four Birds of Prey. PLoS ONE 8(3): e59640. https://doi.org/10.1371/journal.pone.0059640, accessed 22/08/2018.

[125] Crooks KR, Sanjayan M (2006) Connectivity Conservation. Cambridge, UK: Cambridge University Press. 726 p.

[126] Heller NE and Zavaleta ES (2009) Biodiversity management in the face of climate change: A review of 22 years of recommendations. Biological Conservation 142: 14–32.

connectivity for seabird foraging features will be more marginal given the high level of fidelity between individual seabird foraging areas and their breeding colonies. There is also the potential for the classification and management of pSPAs to improve the connectivity of habitats across protected sites through the larval dispersal of benthic species that form these habitats[127,128].

5.4.3 There is potential for an activity currently occurring in the pSPAs to be displaced to other areas, where such activities are not managed. This could lead to negative environmental effects in these areas. For regulated activities, such as renewable energy or aquaculture developments, environmental assessments would be required before an activity could take place, thus limiting the potential for significant cumulative adverse effects to occur.

5.4.4 Where the pSPA sites overlap, adjoin or could influence other protected sites, there is potential for the classification and management of pSPAs to contribute to the cumulative effects associated with the overarching MPA network. A more detailed assessment of cumulative effects will be undertaken should any management measures for the pSPAs be proposed in future.

5.4.5 Management measures for PMFs are in the screening and scoping stage and are yet to be fully consulted upon. In consequence, it is not possible at this stage to ascertain whether there may be cumulative effects arising from interactions between the classification of the pSPAs and these proposals. This possibility will be assessed by the forthcoming Environmental Report component of the SEA for the PMF fisheries management measures.

5.5 Conclusion

5.5.1 Overall, this assessment considers that the increased protection that will result from the classification of the pSPAs will provide environmental benefits for the overarching topic ‘biodiversity, flora and fauna’ and contribute to the achievement of the SEA objectives. This is because the classification of the sites will provide greater clarity and confidence to developers providing evidence in support of assessments required under

[127] Planes, S., Jones, G. P. and Thorrold S. R. (2009) Larval dispersal connects fish populations in a network of marine protected areas. Proceedings of the National Academy of Sciences USA, 2009

[128] Anadon, J. D., M. M. Mancha-Cisneros, B. D. Best, and L. R. Gerber (2013). Habitat-specific larval dispersal and marine connectivity: implications for spatial conservation planning. Ecosphere 4(7):82. http://dx.doi.org/10.1890/ES13-00119.1, accessed 22/08/2018.

the Habitats Regulations. Increasing the assessment requirements and consideration of appropriate mitigation may also result in developers looking to site their projects outside of the boundaries of pSPAs. This in turn would result in reduced harmful activities and potential environmental benefits within these sites.

5.5.2 The manner in which the sites are managed in the future to ensure that the conservation objectives for the qualifying features are achieved also has the potential to result in significant environmental changes. If recommended options for management in the 'Advice to Support Management' documents are implemented, specifically those that target activities and pressures that currently, or might in the future, occur within the pSPAs, these have the potential to result in beneficial environmental effects. In turn, these may also result in the potential for marginal spillover benefits beyond pSPA site boundaries. The implementation of recommended options for management may also result in the potential displacement of an activity and its associated pressures and adverse effects outwith the boundaries of the pSPA. They could also result in increased levels of non-targeted activities within pSPAs.

5.5.3 However, the range and scale of management measures that might be implemented are not currently known and therefore it is not possible to assess the significance of any environmental changes with any level of certainty. Should any specific management measures be subsequently required to meet the objectives of the pSPAs, these will be subject to further consideration under the 2005 Act.

6 Next Steps

6.1.1 The consultation on the Environmental Report is now open, along with the accompanying SPA network Assessment. Views and opinions on this are now invited and should be provided by midnight 9th November 2018.

6.1.2 Please respond to the consultation online at: https://consult.gov.scot/marine-scotland/sea-for-15-proposed-special-protection-areas

6.1.3 Should you require to refer to the original consultation for reference, please see the below links:

http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/marinespas - General policy and Business and Regulatory Impact Assessments

https://www.nature.scot/2016-17-marine-bird-proposed-special-protection-areas-consultation-pspas-consultation-closed - SNH/Nature Scotland inshore pSPAs

http://jncc.defra.gov.uk/page-4563 - Seas off St Kilda pSPA

http://jncc.defra.gov.uk/page-4564 - Seas off Foula pSPA

6.1.4 Copies of the consultation documents and the Environmental Report are available for viewing during office hours at the Scottish Government library at Saughton House, Edinburgh (K Spur, Saughton House, Broomhouse Drive, Edinburgh, EH11 3XD)

6.1.5 If you have any enquiries or difficulties accessing this please contact: Marine_Conservation@gov.scot

6.1.6 Or send your inquiry by post to:

pSPA Consultation
Scottish Government
Marine Planning and Policy Division
Area 1-A South
Victoria Quay
Edinburgh EH6 6QQ

Appendix A.Abbreviations

Acronym	Definition
ABPmer	ABP Marine Environmental Research Ltd
BAP	Biodiversity Action Plan
BGS	British Geological Survey
BRIA	Business and Regulatory Impact Assessment
BTO	British Trust for Ornithology
EC	European Commission
EEC	European Economic Community
EMODnet	European Marine Observation and Data Network
EU	European Union
EUNIS	European Union Nature Information System
Eurosion	European Initiative for Sustainable Coastal Erosion Management
EUSeaMap	European Broad-Scale Seabed Habitat Map
FEAST	Feature Activity Sensitivity Tool
GB	Great Britain
GEN	General
GES	Good Environmental Status
GHG	Greenhouse Gases
GIS	Geographical Information System
HES	Historic Environment Scotland
HFC	Hydrofluorocarbons
HRA	Habitats Regulations Appraisal
JNCC	Joint Nature Conservation Committee
MPA	Marine Protected Area
MS	Marine Scotland
MSY	Maximum Sustainable Yield
nm	Nautical Mile
NMPi	National Marine Plan Interactive
NTS	Non-Technical Summary
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic (Oslo/Paris)
PFC	Perfluorocarbons
PMF	Priority Marine Features

Acronym	Definition
pMPA	possible Marine Protected Area
pSPA	proposed Special Protection Area
Ramsar	Wetlands of International Importance, designated under The Convention on Wetlands (Ramsar, Iran, 1971)
RBMP	River Basin Management Plan
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SCOS	Special Committee on Seals
SEA	Strategic Environmental Assessment
SEIA	Socio-Economic Impact Assessment
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSSI	Site of Specific Scientific Interest
UK	United Kingdom
UKCIP	UK Climate Impacts Programme
UKMMAS	UK Marine Monitoring and Assessment Strategy
UN	United Nations
UNFCC	United Nations Framework Convention on Climate Change
WFD	Water Framework Directive
WWT	Wildfowl & Wetlands Trust

Appendix B.Policy Context of pSPAs

The 2005 Act and the 2004 Regulations require Responsible Authorities to identify the broader policy context in which a plan is situated and any environmental protection objectives that will influence its development and implementation. This Appendix reviews the overarching marine policy objectives and the environmental protection objectives relevant to the classification of pSPAs.

Overarching Marine Policy

Species and habitat conservation is one of several key areas of interest underlying wider marine policy in Scotland. Additional policy areas relate to topics such as aquaculture, marine renewable energy, and the management of commercial and recreational fisheries[129]. In recent years, Scotland has also embarked on a programme of national marine planning in accordance with EU legislation and a growing international recognition of the need to balance competing interests and aims in the marine environment, including conservation. Examples of this wider marine policy are presented below, beginning with international policies and moving down to UK and domestic policies.

At an international level, the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic integrated and updated the 1972 Oslo and 1974 Paris Conventions on land-generated sources of marine pollution[130]. Specifically, it added an annex covering the protection and conservation of marine ecosystems and biodiversity[131]. In 2003, Recommendation 2003/3 was adopted, relating to the establishment of an ecologically coherent network of MPAs in the North-East Atlantic[132].

The EU Marine Strategy Framework Directive (2008/56/EC) obligates Member States to develop programmes of measures which aim to achieve GES in the marine environment by 2020 as well as safeguarding the marine resources that underlie key economic and social activities[133]. It allocates responsibility for the marine environment via a regional approach that makes use of the existing cooperative framework of the

[129] Scottish Government (2017) Marine & Fisheries [online] Available at: http://www.gov.scot/Topics/marine (accessed 05/03/2018)

[130] OSPAR Commission (2017) OSPAR Convention [online] Available at: https://www.ospar.org/convention (accessed 05/03/2018)

[131] ibid

[132] OSPAR Commission (2018) Marine Protected Areas [online] Available at: https://www.ospar.org/work-areas/bdc/marine-protected-areas (accessed 24/01/2018)

[133] European Commission (2017) Our Oceans, Seas and Coasts [online] Available at: http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm (accessed 05/03/2018)

OSPAR Convention[134]. The Directive is implemented within the UK via a three-part Marine Strategy[135].

European Directive 2014/89/EU establishes a framework for maritime spatial planning and serves as a common framework across EU Member States[136]. It recognises that a comprehensive and consistent approach to maritime spatial planning can prevent conflicts between sectors, increase cross-border cooperation, and protect the environment by identifying potential impacts early and pursuing opportunities for multiple uses of space[137]. Within Scotland, the principles of the Directive are delivered through the National Marine Plan.

The UK Marine Policy Statement provides a vision of ”clean, healthy, safe, productive, and biologically diverse oceans and seas” that is shared by all UK administrations and used to guide their respective marine management strategies[138].

The Marine (Scotland) Act 2010 acts as a framework to help balance competing demands on Scotland’s inshore seas (up to 12 nautical miles)[139]. It introduced a duty to protect and enhance the marine natural and historic environment while at the same time streamlining the marine planning and licensing system[140]. Among its conservation objectives is a provision for the establishment of MPAs[141].

The Marine and Coastal Access Act 2009 devolved marine planning and conservation powers to Scottish Ministers in the offshore region to the extent of the continental shelf limits (12-200 nautical miles (nm)), in addition to providing a framework for cooperative management of the marine environment between Scottish Ministers and UK Government[142].

Scotland’s National Marine Plan fulfils joint requirements under the Marine (Scotland) Act 2010 and Marine and Coastal Access Act 2009 to prepare marine plans, providing a

[134] JNCC (2013) The Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention) [online] Available at: http://jncc.defra.gov.uk/page-1370 (accessed 05/03/2018)

[135] JNCC (2016) EU Marine Strategy Framework Directive [online] Available at: http://www.gov.scot/Topics/marine/seamanagement/marineact (accessed 05/03/2018)

[136] European Commission (2014) Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for marine spatial planning [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.257.01.0135.01.ENG%20 (accessed 05/03/2018)

[137] European Commission (2017) Maritime spatial planning [online] Available at: https://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning_en (accessed 05/03/2018)

[138] Scottish Government (2015) UK Marine Policy Statement [online] Available at: http://www.gov.scot/Topics/marine/seamanagement/international/MPS (accessed 05/03/2018)

[139] Scottish Government (2017) Marine (Scotland) Act [online] Available at: http://www.gov.scot/Topics/marine/seamanagement/marineact (accessed 05/03/2018)

[140] ibid

[141] Scottish Government (2014) Marine and Coastal Access Act 2009 [online] Available at: http://www.gov.scot/Topics/marine/seamanagement/marineact/ukbill (accessed 05/03/2018)

[142] ibid

cohesive approach to the management of both inshore and offshore waters[143] in accordance with EU Directive 2014/89/EU[144] on maritime spatial planning. It seeks to promote development in a way that is compatible with the protection and enhancement of the marine environment[145].

The pSPAs are in some cases extensions to terrestrial and coastal SSSIs or SPAs. As such, many of the activities that could impact on these sites may be co-governed by the terrestrial planning system. The interaction between the marine and terrestrial planning system is explained in Scotland's National Marine Plan[146] and Circular 1/2015 - The relationship between the statutory land use planning system and marine planning and licensing[147]. This includes the potential role of local authorities in ensuring that any proposed mitigation measures can be effectively delivered.

Biodiversity, Flora and Fauna

International policies provide a framework for the conservation, protection, and sustainable use of biodiversity, flora, and fauna. In relation to the marine and coastal environment, this includes planning for sustainable fisheries and mariculture, the protection of migratory species including birds and fish stocks and the protection of marine and coastal habitats, and the management of non-native invasive species. These are often set out in the context of taking an ecosystem approach to the management and restoration of marine and coastal environments. Building resilience to climate change is also a cross-cutting theme.

The 2020 Challenge for Scotland's Biodiversity[148] is Scotland's response to the international UN Aichi Targets for 2020[149] and the EU Biodiversity Strategy to 2020[150]. The 2020 Challenge supplements the 2004 Scottish Biodiversity Strategy[151] and

[143] Scottish Government (2014) Scotland's National Marine Plan – A Single Framework for Managing Our Seas [online] Available at: http://www.gov.scot/Resource/0047/00475466.pdf (accessed 05/03/2018)

[144] European Commission (2014) Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for marine spatial planning [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.257.01.0135.01.ENG%20 (accessed 05/03/2018)

[145] Scottish Government (2014) Scotland's National Marine Plan – A Single Framework for Managing Our Seas [online] Available at: http://www.gov.scot/Resource/0047/00475466.pdf (accessed 05/03/2018)

[146] Scottish Government (2014) Scotland's National Marine Plan – A Single Framework for Managing Our Seas [online] Available at: http://www.gov.scot/Resource/0047/00475466.pdf (accessed 05/03/2018)

[147] Scottish Government (2015) PLANNING CIRCULAR 1/2015 The relationship between the statutory land use planning system and marine planning and licensing. Available at: http://www.gov.scot/Resource/0047/00479384.pdf (accessed 26/06/2018)

[148] Scottish Government (2013) 2020 Challenge for Scotland's Biodiversity: A Strategy for the conservation and enhancement of biodiversity in Scotland [online] Available at: http://www.gov.scot/Resource/0042/00425276.pdf (accessed 05/03/2018)

[149] Convention on Biological Diversity (2010) Aichi Biodiversity Targets [online] Available at: https://www.cbd.int/sp/targets/default.shtml (accessed 05/03/2018)

[150] European Commission (2011) The European Biodiversity Strategy to 2020 [online] Available at: http://ec.europa.eu/environment/nature/info/pubs/docs/brochures/2020%20Biod%20brochure%20final%20lowres.pdf (accessed 05/03/2018)

[151] Scottish Government (2004) Scotland's Biodiversity Strategy: It's in Your Hands – A strategy for the conservation and enhancement of biodiversity in Scotland [online] Available at: http://www.scotland.gov.uk/Publications/2004/05/19366/37239 (accessed 26/10/2015)

together they comprise the overall Scottish Biodiversity Strategy. A Strategy for Marine Nature Conservation in Scotland's Seas is the main tool for enacting the principles of the 2020 Challenge within the marine environment[152].

A Strategy for Marine Nature Conservation in Scotland's Seas supports the development of an ecologically coherent network of MPAs to help achieve 'GES' under the Marine Strategy Framework Directive and to meet the requirements of the Birds and Habitats Directives[153]. It also proposed a system of 'priority marine features' (PMFs) to guide the identification of MPAs and provide conservation focus for marine planning and other activities.

Soil (Marine Geology and Sediments) Policy

It was proposed that the topic of 'Soil' (specifically, the consideration of seabed strata and/or bottom sediments) be given consideration under the topic of 'Biodiversity, Flora, and Fauna'. As such, soil policy and protection objectives relevant to the assessment are presented below.

At present, there is no legislative or policy tool specifically developed for the protection of soil[154]. There are, however, policies that indirectly protect the soil due to its close link to other topics. Nature conservation designations and the management procedures for these areas are often aimed at enhancing or protecting biodiversity, geodiversity, landform value, and cultural resources of the site, which in turn protects the soil[155]. For example, marine geology forms part of the basis for the designation of MPAs within Scottish waters[156]. Specifically, MPAs strive to protect rare and representative marine species, habitats, and geodiversity (defined as the variety of landforms and natural processes that underpin the marine landscape). Similarly, SSSIs[157] are those areas of land and water that best represent Scotland's natural heritage in terms of its flora, fauna, geology, geomorphology, and/or a mixture of these natural features, as designated by SNH under the Nature Conservation (Scotland) Act 2004[158].

At the European level, the Marine Strategy Framework Directive includes an annex (Annex III) of 11 qualitative descriptors (criteria amended in 2017[159]) to help Member

[152] Scottish Government (2011) A Strategy for Marine Nature Conservation in Scotland's Seas [online] Available at: http://www.gov.scot/Resource/Doc/295194/0115590.pdf (accessed 24/01/2018)

[153] ibid

[154] Scottish Government (2009) The Scottish Soil Framework [online] Available at: http://www.gov.scot/Publications/2009/05/20145602/0 (accessed 05/03/2018)

[155] ibid

[156] Scottish Government (2016) Nature Conservation MPAs [online] Available at: http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/ncmpas (accessed 05/03/2018)

[157] SNH (2017) Sites of Special Scientific Interest [online] Available at: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/national-designations/sites-special-scientific-interest (accessed 05/03/2018)

[158] ibid

[159] European Commission (2017) Commission Directive (EU) 2017/845 of 17 May 2017 amending Directive 2008/56/EC of the European Parliament and of the Council as regards the indicative lists of elements to be taken into account for the preparation of marine strategies (Text with EEA relevance) [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1495097018132&uri=CELEX:32017L0845 (accessed 05/03/2018)

States interpret what GES means in practice[160]. GES conditions are those where 'the sea floor integrity ensures functioning of the ecosystem and benthic ecosystems, in particular, are not adversely affected'. 'Sea-floor integrity' is defined in terms of physical (i.e. depth), chemical (i.e. substrate type), and biological (i.e. species composition) characteristics[161]. It is also regarded as crucial to achieving the Strategy's overarching aims of protecting biodiversity and ensuring the sustainable use of the marine environment[162].

The pSPAs are in some cases extensions to coastal SPAs and so policies targeting coastal protection and management are relevant. EU Directive 2014/89/EU (the Maritime Spatial Planning Directive) aims to coordinate the development and delivery of policies across a wide spectrum of both marine and terrestrial activities in a way that is mindful of the natural limits of the coastal environment[163].

In Scotland, Integrated Coastal Zone Management is achieved via the work of seven Local Coastal Partnerships[164].

Water Policy

It is proposed that the topic of 'Water' be given consideration under the topic of 'Biodiversity, Flora, and Fauna'. As such, water policy and protection objectives relevant to the assessment are presented below.

At the European level, the Water Framework Directive (2000/60/EC) (WFD) was introduced as a more comprehensive framework for protecting, managing, and improving Europe's water bodies including rivers, lochs, transitional waters (estuaries), coastal waters, groundwater and groundwater dependent wetlands[165]. The WFD sets out a requirement for an assessment of both chemical and ecological status of each individual waterbody and has a goal of bringing all European waters to 'good ecological and chemical status'.

[160] European Commission (2016) Our Oceans, Seas and Coasts – Descriptor 6: Sea-floor Integrity [online] Available at: http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-6/index_en.htm (accessed 05/03/2018)

[161] ibid

[162] European Commission (2016) Our Oceans, Seas and Coasts – Descriptor 6: Sea-floor Integrity – Why should we pay attention to the sea-floor integrity? [online] Available at: h http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-6/index_en.htm (accessed 05/03/2018)

[163] European Commission (2014) Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0089 (accessed 05/03/2018)

[164] Scottish Government (2014) Managing Scotland's Coastline [online] Available at: http://www.gov.scot/Topics/marine/marine-environment/coast (accessed 05/03/2018)

[165] European Commission (2000) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060 (accessed 05/03/2018)

Scotland fulfils its water protection obligations under the WFD primarily through the Water Environment and Water Services (Scotland) Act 2003[166] which defines the establishment of River Basin Management Plans (RBMP)[167], and the Water Environment (Controlled Activities) (Scotland) Regulations 2011[168]. The first cycle of RBMP ended in 2014 and the second cycle began the subsequent year. The second cycle plans are informed by what was learnt through delivering the first cycle objectives and will target improvements in the development and application of specific plans and measures. The plans are focussed on action to protect and improve the water environment through a phased programme for the next 12 years.

Other relevant legislation includes the Pollution Prevention and Control (Scotland) Regulations 2012, which apply specifically to pollution originating from industry discharges[169].

The EU Floods Directive (2007/60/EC)[170] is implemented at the national level through the Flood Risk Management (Scotland) Act 2009[171]. The Directive mandates the creation of flood risk management plans for all inland and coastal areas at risk of flooding, integrating their development and implementation with existing River Basin Management Plans. Flood risk management plans are designed to minimise adverse impacts due to flooding on a range of receptors, including human health, the environment, and cultural heritage.

Climatic Factors Policy

It is proposed that the SEA topic of 'Climatic Factors' be scoped into the assessment under the topic of 'Biodiversity, Flora, and Fauna', given the potential role of the marine environment in mitigating and adapting to climate change.

In November 2016, the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement came into force[172]. The Paris Agreement is the first legally binding global climate deal and set out aims to limit global warming to well below 2°C as well as pursuing further efforts to limit it to 1.5°C [173]. A further long-term goal is to

[166] Water Environment and Water Services (Scotland) Act 2003, asp 3 [online] Available at: http://www.legislation.gov.uk/asp/2003/3/pdfs/asp_20030003_en.pdf (accessed 05/03/2018)

[167] SEPA (2016) River Basin Management Planning [online] Available at: http://www.sepa.org.uk/environment/water/river-basin-management-planning/ (accessed 05/03/2018)

[168] The Water Environment (Controlled Activities) (Scotland) Regulations 2011, SSI No. 206 [online] Available at: http://www.legislation.gov.uk/ssi/2011/209/pdfs/ssi_20110209_en.pdf (accessed 05/03/2018)

[169] The Pollution Prevention and Control (Scotland) Regulations 2012, SSI No. 306 [online] Available at: http://www.legislation.gov.uk/ssi/2012/360/introduction/made (accessed 05/03/2018)

[170] European Commission (2007) The EU Floods Directive [online] Available at: http://ec.europa.eu/environment/water/flood_risk/ (accessed 05/03/2018)

[171] Flood Risk Management (Scotland) Act 2009, asp 6 [online] Available at: http://www.legislation.gov.uk/asp/2009/6/pdfs/asp_20090006_en.pdf (accessed 05/03/2018)

[172] UNFCC (2016) The Paris Agreement [online] Available at: http://unfccc.int/paris_agreement/items/9485.php (accessed 05/03/2018)

[173] European Commission (2016) Paris Agreement [online] Available at: http://ec.europa.eu/clima/policies/international/negotiations/paris/index_en.htm (accessed 05/03/2018)

achieve net-zero levels of global greenhouse gas emissions by the second half of this century. The Agreement also covers a range of other issues such as mitigation through reducing emissions, adaptation, and loss and damage[174].

The Climate Change (Scotland) Act 2009 creates the statutory framework for greenhouse gases (GHG) emissions reductions in Scotland. It sets a target for a reduction in emissions of the basket of Kyoto Protocol greenhouse gases (GHGs)[175] of 80% by 2050 as compared to the 1990/1995 baseline levels, alongside an interim target of a 42% reduction by 2020. These targets are currently being revisited through proposals for a new Climate Change Bill which recently underwent both SEA and public consultation[176]. Proposals include increasing the ambition of the 2050 target to a 90% GHG emissions reduction from baseline and an interim 2040 target of at least a 78% reduction in GHG emissions from baseline levels.

The Marine (Scotland) Act 2010 specifies a duty for Ministers and the public sector to manage and progress actions within the marine environment in a way 'best calculated to mitigate, and adapt to, climate change so far as is consistent with the proper exercise of that function'[177]. Scotland's National Marine Plan[178] considers climate change in terms of how actions undertaken within the Plan can help to mitigate GHG emissions, in addition to how these actions need to be adapted to take into account the effects of climate change. The Plan also stipulates that the development and use of the marine environment should not have a significant impact on the national status of PMFs. Many of these are known for their role in carbon sequestration, including within SPAs.

Scotland's Climate Change Adaptation Programme is a direct requirement of the Climate Change (Scotland) Act 2009[179]), replacing the Climate Change Adaptation Framework[180] and accompanying Sector Action Plans[181]. Among its proposals and policies for meeting adaptation objectives are actions around conserving marine carbon stores and conducting additional research into the role of blue carbon ecosystems in

[174] ibid

[175] The basket of Kyoto Protocol greenhouse gases comprises carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), for which the baseline is 1990; and hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6), for which the baseline is 1995. Nitrogen trifluoride (NF_3) has subsequently been added and applies to the second commitment period of 2013-20.

[176] Scottish Government (2017) Climate Change Bill – Consultation Paper [online] Available at: http://www.gov.scot/Publications/2017/06/8208/0 (accessed 02/11/2017)

[177] Marine (Scotland) Act 2010, asp 5 [online] Available at: http://www.legislation.gov.uk/asp/2010/5/pdfs/asp_20100005_en.pdf (accessed 05/03/2018)

[178] Scottish Government (2015) Scotland's National Marine Plan [online] Available at: http://www.gov.scot/Publications/2015/03/6517 (accessed 05/03/2018)

[179] Climate Change (Scotland) Act 2009, asp 12 [online] Available at: https://www.legislation.gov.uk/asp/2009/12/pdfs/asp_20090012_en.pdf (accessed 05/03/2018)

[180] Scottish Government (2009) Scotland's Climate Change Adaptation Framework [online] Available at: http://www.gov.scot/Resource/Doc/295110/0091310.pdf (accessed 10/07/2018)

[181] Scottish Government (2011) Sector Action Plans [online] Available at: http://www.gov.scot/Topics/Environment/climatechange/scotlands-action/adaptation/AdaptationFramework/SAP (accessed 10/07/2018)

carbon sequestration[182]. The role of Marine Planning and MPAs in protecting these ecosystems is also noted[183].

[182] Scottish Government (2014) Climate Ready Scotland Scottish Climate Change Adaptation Programme – Part 2 – The Adaptation Programme [online] Available at: http://www.gov.scot/Publications/2014/05/4669/4 (accessed 05/03/2018)

[183] Scottish Government (2014) Climate Ready Scotland Scottish Climate Change Adaptation Programme – Part 2 – The Adaptation Programme [online] Available at: http://www.gov.scot/Publications/2014/05/4669/4 (accessed 05/03/2018)