

SEA of Marine Proposed Special Protection Areas

**Strategic Environmental Assessment
Updated Environmental Report**

June 2019

Report prepared by:



For:



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.

The Scottish Government is undertaking a Strategic Environmental Assessment (SEA) of proposals to classify additional SPAs in the Scottish marine environment. An Environmental Report¹ ('the 2018 Environmental Report') was published for consultation on the proposed network of pSPAs in accordance with the Environmental Assessment (Scotland) Act 2005 ('the 2005 Act'). In order to address consultee responses, the Scottish Government is undertaking a supplementary consultation² based upon a revised and expanded set of SEA Reasonable Alternatives, and is inviting comments on these alongside this updated Environmental Report. Scottish Government has also taken the opportunity to update the preferred policy recommendation on classification of the pSPAs in light of Final Advice to Scottish Ministers from SNH and JNCC³.

What is Strategic Environmental Assessment?

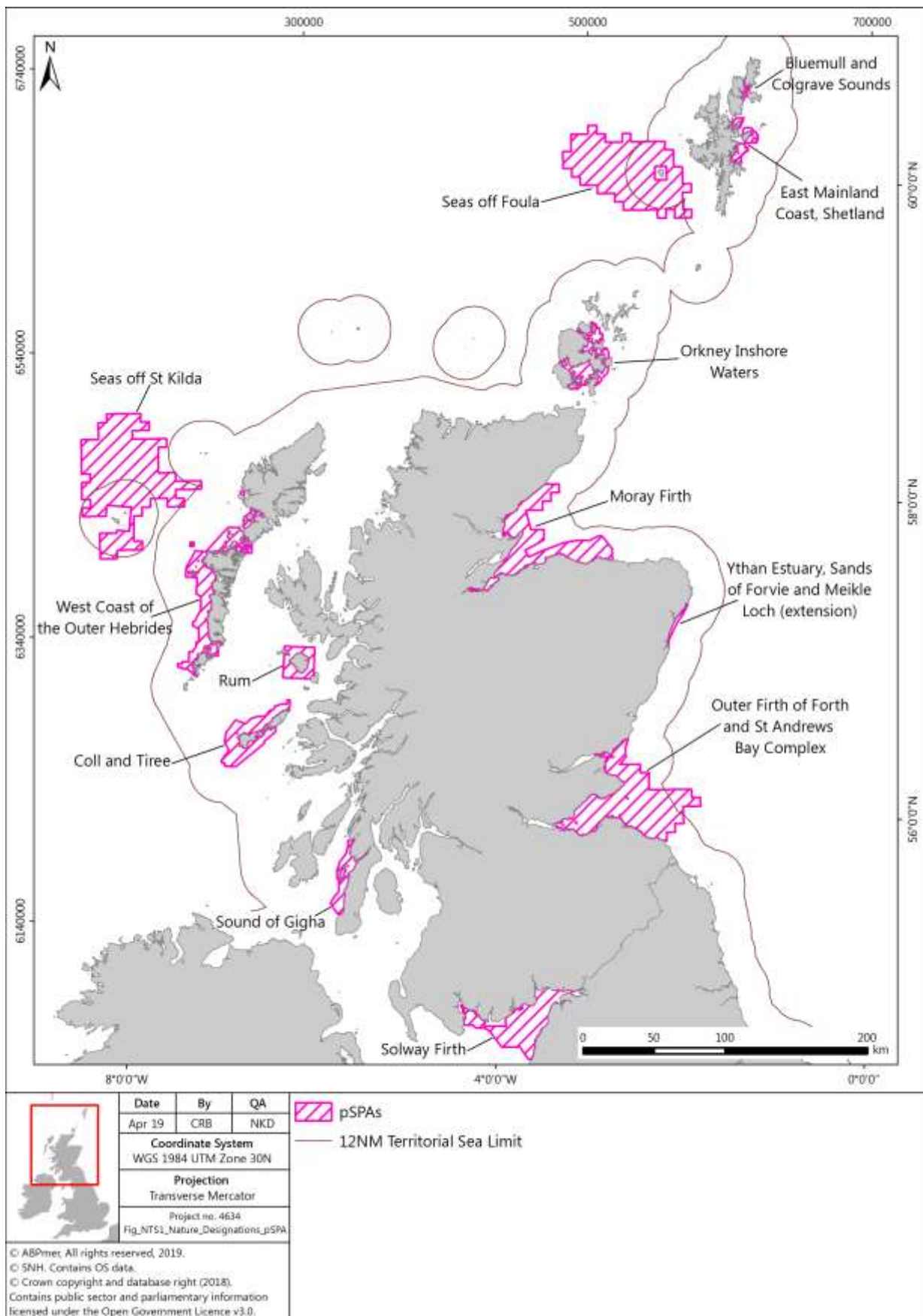
The Environmental Assessment (Scotland) Act 2005 ('the 2005 Act') requires that certain public plans, programmes and strategies be assessed for their potential effects on the environment. Strategic Environmental Assessment (SEA) is the process used to fulfil this requirement, and includes consultation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

¹ Consultation on the Strategic Environmental Assessment for 15 Proposed Special Protection Areas. Available at: <https://consult.gov.scot/marine-scotland/sea-for-15-proposed-special-protection-areas/> (accessed 14/03/2019)

² Consultation on the updated proposals for proposed Special Protection Areas. Available at: <https://consult.gov.scot/marine-scotland/sea-and-site-classification/>

³ <https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/international-designations/natura-sites/marine-natura-sites>

Figure NTS1 Marine proposed Special Protection Areas



SEA identifies the likely significant environmental impacts of plans and policies, and alternatives to them. SEA also identifies mitigation measures to avoid or minimise any significant adverse effects and highlights opportunities for enhancements of beneficial effects. SEA provides opportunities for all concerned to consider this information and use it to inform their views on the draft plan or policy.

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 preferred policy recommendation for Scottish Ministers assessed herein follows the Final Advice provided by SNH and JNCC which identifies sites and features considered essential for protection. In some cases, the pSPAs are additional to the current SPA network, while others are an extension of existing SPAs to include additional species and/or habitat.

The classification of the 13 pSPAs taken forward as the preferred policy recommendation is considered to be the most robust approach available for meeting the statutory obligations of the Birds Directive. This updated Environmental Report describes and evaluates the likely significant effects on the environment of the preferred policy recommendation.

Of the 13 pSPAs that are proposed to be classified, 9 lie entirely within Scottish territorial waters (within 12 nm of the territorial limit). An additional three sites have offshore components. The pSPAs have been selected in accordance with the 'UK SPA Selection Guidelines'⁴.

The pSPAs cover a range of species which use Scottish Waters:

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

⁴ JNCC (1999) SPA selection guidelines [online] Available at: <http://jncc.defra.gov.uk/page-1405> (accessed 24/01/2018)

SPAs that are classified should 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 collated and summarised in Table NTS1.

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 assessment has been undertaken. The environmental changes that are likely to result from the classification of pSPAs has been assessed. In addition, the potential changes that may result from the recommended options for managing activities (i.e. fishing) within the pSPAs have also been assessed (see Table NTS1). These recommended management options are considered indicative and do not constrain future decisions or represent the final management measures that may be adopted by the Scottish Government for individual sites. Any specific management measures that are subsequently required to meet the objectives of the pSPAs will themselves 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 'Biodiversity, Flora, and Fauna', 'Soil', 'Water' and 'Climatic Factors' (including regulation of climate). 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 separately⁵.

Which reasonable alternatives have been assessed?

The preferred policy recommendation for Scottish Ministers is to classify 13 pSPAs as this is considered to be the most robust way of meeting the objective of fulfilling the statutory obligations of the Birds Directive. The 2005 Act requires that the likely significant effects on the environment of any Reasonable Alternatives to the preferred policy recommendation are identified, described and evaluated, taking into account the objectives and geographical scope of the plan or programme.

A new set of four SEA Reasonable Alternatives have been developed by Marine Scotland to address the comments made by consultees to the 2018 Environmental Report. These Reasonable Alternatives are considered 'reasonable' in terms of the 2005 Act as they meet the objective of classifying the pSPAs in order to fulfil statutory obligations under the Birds Directive. Compared to the preferred policy recommendation the first two of the SEA Reasonable Alternatives would provide a greater level of provision for the bird species, and the third and fourth would provide a reduced level of provision.

Other alternatives were suggested by some consultees in their responses to the September 2018 consultation, i.e. no designations and designating alternative areas to those proposed. However, these were not considered reasonable alternatives under the 2005 act for the following reasons. 'No designations' (maintaining the status quo and not classifying the pSPAs) would not meet the objective of the plan in terms of fulfilling Scottish Government obligations under the Birds Directive and is therefore not considered to be a 'reasonable alternative' under the 2005 Act. 'Designating alternative areas to those proposed' would also fail to meet the requirements of the Birds Directive, and is therefore not considered to be a 'reasonable alternative' under the 2005 Act.

⁵ The Scottish MPA Project: Second Iteration of Site Proposals – Developing the Evidence Base for Impact Assessments, ABPmer

The 2016/17 public consultation on the 15 pSPAs included two pSPAs located off Orkney mainland: North Orkney pSPA and Scapa Flow pSPA. Marine Scotland, on the basis of advice from SNH, consider there is a case to rationalise the two pSPAs to aid future management. The preferred policy recommendation is to classify Orkney Inshore Waters pSPA. The updated Environmental Report has also assessed the alternative option of classifying North Orkney pSPA and Scapa Flow pSPA. SNH's Final Advice removes the Pentland Firth pSPA from the network, resulting in the number of sites included reducing from 15 to 13.

What is the current state of the environment?

Scotland's marine environment supports 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 other waterbirds. 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 pSPAs, 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 habitat⁶.

Scotland's marine biodiversity is protected by a range of international 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 groups include marine mammals (bottle-nosed dolphin, harbour porpoise and seals) otter, birds, fish (including sea lamprey and Atlantic salmon). The current health and condition of a number of habitats and species has been declining⁷. 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 change⁸.

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

⁶ 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.

⁷ Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

⁸ The Scottish Government (2013) FEAST – Feature Activity Sensitivity Tool. [online] Available at: <http://www.marine.scotland.gov.uk/feast/> (accessed 02/05/18)

oceanographic conditions. Waterbirds (waterfowl and waders) are also both increasing and decreasing year on year, depending on the species and location⁹.

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 populations¹⁰.

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 generation¹¹.

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 and maerl beds¹². 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.

What are the likely significant environmental effects of the pSPAs?

Overall, the increased protection that will result from the preferred policy recommendation to classify 13 pSPAs will provide environmental benefits. The classification of the sites will introduce the formal requirement to consider whether a project has the potential to affect any SPA features under the Habitats Regulation Appraisal (HRA) process and introduce mitigation measures where a project has the potential to adversely affect SPA features. This, in combination with making developers more aware of the birds that are protected, will support more effective HRAs and Environmental Impact Assessments (EIAs) as part of marine licence applications. Developers may alternatively look to locate their developments elsewhere to avoid these sites, thereby contributing to more sustainable marine planning. This in turn

⁹ 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.

¹⁰ 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

¹¹ 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).

¹² 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.

would reduce future pressures associated with regulated activities within the pSPAs and provide potential environmental benefits.

Although no specific management measures are proposed at present for the pSPAs, it is recognised that the way in which the sites are managed could also result in potential environmental effects. In generic terms, management measures have the potential to result in beneficial environmental effects where these target specific activities and pressures that currently, or might in the future, occur within the pSPAs.

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 associated with management measures 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 and migrating birds and inshore assemblages that move between SPAs as the pSPAs have the potential to improve connectivity between protected areas for these features^{13,14}. The potential cumulative benefits of improving connectivity for foraging seabirds 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^{15,16}.

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 updated Environmental Report is now open. Views and opinions on this are now invited and should be provided by midnight 26th July 2019. We are seeking views on the following questions:

¹³ Crooks KR, Sanjayan M (2006) *Connectivity Conservation*. Cambridge, UK: Cambridge University Press. 726 p.

¹⁴ 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.

¹⁵ 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

¹⁶ 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.

1. With respect to the SEA process, do you have any comments on the updated ER?
2. Do you have any comments on the SEA Reasonable Alternatives?
3. With respect to the classification of SPAs, do you agree with the preferred policy recommendation, and if not why not?
4. Do you prefer the option to classify Orkney Inshore Waters pSPA or the alternative option to classify North Orkney pSPA and Scapa Flow pSPA? What are the reasons for your preference?

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

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-ppas-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

Copies of the consultation documents and the updated 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 taken into account before the proposals are finalised. 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 Updates to the 2018 Environmental Report

- 1.1.1 Following consultation on a previous Environmental Report ('the 2018 Environmental Report'), this updated Environmental Report has been produced in order to support a supplementary consultation based upon a revised and expanded set of SEA Reasonable Alternatives, set out in Section 3.6, and minor changes to address consultation responses where required. It is a standalone document, based upon the 2018 Environmental Report, and key changes that have been made are highlighted at the beginning of each chapter.
- 1.1.2 Changes within this introduction chapter are limited to the inclusion of paragraphs 1.2.5, 1.2.6 and 1.3.4, and are intended to provide the reader with a greater understanding of the process that has been followed thus far and also going forward.

1.2 Background

- 1.2.1 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 designation and management of Marine Protected Areas, including Special Protection Areas (SPAs), will make a significant contribution to the protection, enhancement and health of the marine area¹⁷.
- 1.2.2 SPAs are classified under the EU Birds Directive 2009/147/EC¹⁸. 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 species¹⁹.
- 1.2.3 Scotland currently has 45 existing marine SPAs, of which 31 are extensions to seabird colony SPAs. Previous consultation exercises were undertaken in 2016/2017 on a proposed network of 15 marine SPAs in UK Waters²⁰.

¹⁷ Scottish Government (2015) Scotland's National Marine Plan. Available at: <http://www.gov.scot/Resource/0047/00475466.pdf> (accessed 11/06/2018)

¹⁸ 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)

¹⁹ 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)

²⁰ 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).

- 1.2.4 Building on the work of the SPA Review Working Group and taking account of existing guidelines on the identification of SPAs²¹, Scottish Natural Heritage (SNH), the Joint Nature Conservation Committee (JNCC) and Natural England identified 15 sites based on the scientific evidence and selection process 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.
- 1.2.5 The Scottish Government is undertaking a Strategic Environmental Assessment (SEA) of the proposal to classify additional SPAs in the Scottish marine environment and previously an Environmental Report²² ('the 2018 Environmental Report') was published for consultation in accordance with the Environmental Assessment (Scotland) Act 2005 ('the 2005 Act').
- 1.2.6 In order to address consultee responses, specifically with regard to the previous assessment of reasonable alternatives, the Scottish Government is undertaking a supplementary consultation based upon a revised and expanded set of SEA Reasonable Alternatives, and is inviting comments on these alongside this updated Environmental Report. This is because respondents asked for more information, greater clarity and suggested additional alternatives. Scottish Government has also taken the opportunity to update the preferred policy recommendation on classification of the pSPAs in light of Final Advice to Scottish Ministers from SNH and JNCC.

1.3 Strategic Environmental Assessment

- 1.3.1 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 environment²³. Strategic Environmental Assessment (SEA) is the process used to fulfil this requirement, and includes consultation with both the public and the Consultation Authorities²⁴. The Act also sets out the information that is required to be provided in this Environmental Report.
- 1.3.2 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

²¹ JNCC, undated. UK SPA selection guidelines [online] Available at: <http://jncc.defra.gov.uk/page-1405> (accessed 10/05/2018)

²² Consultation on the Strategic Environmental Assessment for 15 Proposed Special Protection Areas. Available at: <https://consult.gov.scot/marine-scotland/sea-for-15-proposed-special-protection-areas/> (accessed 14/03/2019)

²³ 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)

²⁴ Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Environment Scotland (HES).

scope and level of detail. Comments were invited from the Scottish Consultation Authorities.

- 1.3.3 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).
- 1.3.4 The proposed scope of the assessment and methodology has been carried through into this document from the 2018 Environmental Report and the screening and scoping exercise undertaken prior to the 2018 Environmental Report is considered to remain valid.
- 1.3.5 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 2004²⁵ (the '2004 Regulations').
- 1.3.6 Marine Scotland commissioned ABP Marine Environmental Research Ltd. (ABPmer) to undertake the assessment stage of the SEA and prepare this updated Environmental Report.

1.4 Purpose and structure of this report

- 1.4.1 The purpose of this Environmental Report is to document the updated findings of the SEA on the classification of the pSPAs based upon a revised and expanded set of Reasonable Alternatives (Section 3.6), as well as changes to the preferred policy recommendation (Section 2.5). This updated Environmental Report replaces the previous 2018 Environmental Report and can be read as a stand-alone document in its own right. Views are now being sought from the public, the Scottish Consultation Authorities and the UK consultation bodies²⁶ (Historic England, Natural England, and the Environment Agency).
- 1.4.2 The remainder of this updated Environmental Report is structured as follows:
 - Section 2 provides revised and updated information on the proposed classification of the pSPAs;
 - Section 3 presents the approach to the SEA, including the methodology used;
 - Section 4 provides an updated description of the relevant components of the environment that could be affected by the classification of the pSPAs;

²⁵ The Environmental Assessment of Plans and Programmes Regulations 2004, SI 2004/1663 [online] Available at: <http://www.legislation.gov.uk/ukxi/2004/1633/introduction/made> (accessed 29/11/2017)

²⁶ 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)

- Section 5 sets out the updated results of the assessment; and
- Section 7 considers the next steps in both the classification of the pSPAs as well as the SEA process.

1.4.3 The Non-Technical Summary precedes Section 1.

2 Special Protection Areas

2.1 Updates to the 2018 Environmental Report

2.1.1 The main updates to this section are the inclusion of background information on the outcomes of the 2018 consultation and updated information on the preferred policy recommendation.

2.2 Background

2.2.1 SPAs are classified under the EU Directive 2009/147/EC²⁷, the 'Birds Directive'. The Birds Directive seeks to conserve all wild birds in the EU by setting out rules for their protection and management²⁸.

2.2.2 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 birds²⁹. SPAs, along with Special Areas of Conservation (SACs)³⁰ are components of the Natura 2000 network that form a unified, multinational system of protected sites to support rare and endangered European habitats and species³¹. Marine SPAs and SACs are also referred to as European Marine Sites³².

2.2.3 The protection of SPAs and SACs is provided for by the Birds Directive and Habitats Directive respectively. The Birds Directive is transposed into domestic legislation via the Habitats Regulations and, the Wildlife and Countryside Act 1981 (as amended). The Habitats Directive is transposed into domestic law via the Habitats Regulations³³. Marine SPAs and SACs are

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 (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%3A128046> (accessed 14/05/2018)

²⁹ 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)

³⁰ 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)

³¹ 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)

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)

³³ 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.

subject to special provisions for protecting and managing these marine areas, as outlined within Habitats Regulations 33 to 35³⁴.

- 2.2.4 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 occurring³⁵.

2.3 Existing SPAs

- 2.3.1 Scotland currently has 153 classified SPAs that cover over 1.23 million hectares (4,600 square miles) of land and inshore waters³⁶. Of these, 45 are marine SPAs, of which 31 are marine extensions to seabird colony SPAs³⁷. 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 display³⁸. These SPAs extend out up to 4 km from shore.

2.4 Previous consultation on SPA classification

- 2.4.1 Previous consultations have explored both the proposal to classify the SPAs and the feedback from the 2018 Environmental Report. These are summarised below in chronological order.
- 2.4.2 Public consultations on 15 pSPAs were undertaken by SNH and JNCC on behalf of Scottish Ministers in 2016/17^{39,40}. Following the consultations, SNH and JNCC completed a detailed review of all comments received.
- 2.4.3 To address some of the comments received to the 2016/17 consultations, Marine Scotland commissioned SNH to undertake a Network Assessment⁴¹ of the 15 pSPAs. An SEA was also undertaken at that time and the findings reported in the 2018 Environmental Report.

³⁴ 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)

³⁵ 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)

³⁶ 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)

³⁷ 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)

³⁸ *ibid*

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 SNH (2017). 2016-17 Marine bird proposed Special Protection Areas consultation (pSPAs) - consultation closed. Available at: <https://www.nature.scot/2016-17-marine-bird-proposed-special-protection-areas-consultation-ppas-consultation-closed> (13/03/2019).

⁴¹ SNH (2018). Scottish proposed SPA network assessment - September 2018. Available at: <https://www.nature.scot/scottish-proposed-spa-network-assessment-september-2018> (accessed 13/03/2019).

- 2.4.4 The Network Assessment and 2018 Environmental Report were consulted on together in 2018⁴², with views invited on the approach taken and the conclusions reached in both assessments. Consultee's responses on the 2018 Environmental Report and Network Assessment are provided on the consultation website
- 2.4.5 SNH and JNCC's findings from the review of their consultation are presented in the 'Consultation Report and recommendations on a network of proposed marine SPAs⁴³' and includes some recommended changes to the pSPAs based on substantive scientific objections raised during the consultation. These changes form part of SNH and JNCC's Final Advice on the proposed network⁴⁴. The findings from the Network Assessment, which considered appropriate levels of representation for each species in the Scottish MPA network, are also taken account of in SNH and JNCC's Final Advice.
- 2.4.6 The changes recommended in SNH and JNCC's Final Advice on the proposed SPA network are summarised below:
- Withdrawal of the Pentland Firth pSPA;
 - Removal of common eider, long-tailed duck and red-breasted merganser as qualifying features from the East Mainland Coast, Shetland pSPA and minor change to boundary to reflect distributions of remaining qualifying features;
 - Addition of Slavonian grebe (non-breeding) as a qualifying feature to the Sound of Gigha pSPA; and
 - Combining the North Orkney pSPA and Scapa Flow pSPAs into a single site 'Orkney Inshore Waters pSPA' with the removal of common goldeneye as a qualifying feature and boundary change at South Ronaldsay. If this recommendation is taken forward to classification by Scottish Ministers the network of sites would reduce from 14 to 13.
- 2.4.7 This Environmental Report updates the 2018 assessment findings to take account of a revised and expanded set of reasonable alternatives, and updated preferred policy recommendation, which have been developed in light of the responses to the 2018 consultations. In addition, it includes minor changes addressing consultation responses on the 2018 Environmental Report where appropriate.

2.5 Proposed Special Protection Areas

- 2.5.1 The preferred policy recommendation is considered to be the most robust approach available for meeting the statutory obligations of the Birds Directive

⁴² Scottish Government (2018). Consultation on the Strategic Environmental Assessment for 15 proposed Special Protection Areas. Available at: <https://consult.gov.scot/marine-scotland/sea-for-15-proposed-special-protection-areas/> (accessed 13/03/2019).

⁴³ <https://www.nature.scot/consultation-report-network-proposed-special-protection-areas>

⁴⁴ <https://www.nature.scot/marine-special-protection-areas-final-advice-scottish-government>

and forms the preferred policy recommendation for Scottish Ministers. This updated Environmental Report describes and evaluates the likely significant effects on the environment of the preferred policy recommendation and expanded set of reasonable alternatives.

- 2.5.2 The preferred policy recommendation follows the Final Advice provided by SNH and JNCC which, based on the scientific evidence, selection process and public consultation has identified sites and features which they consider essential for protection. In some cases, the pSPAs will be additional to the current SPA network, while others are an extension of existing SPAs to include additional species and/or habitat.
- 2.5.3 The process of site selection is presented in the Overview document⁴⁵ and the scientific case for each pSPA is summarised in its respective Site Selection Document⁴⁶. The Network Assessment undertaken by SNH in 2018⁴⁷ addresses appropriate levels of representation for each species in the Scottish MPA network. In addition, details on the data, analysis methods, and general species ecology and behaviour that underpin the selection process are provided in the JNCC Reports series, while JNCC generic documents provide non-technical supplementary advice⁴⁸. SNH and JNCC's Final Advice⁴⁹ on the proposed network also include some recommended changes to the pSPAs based on substantive scientific objections raised during the 2018 consultation.
- 2.5.4 Of the 13 pSPAs that are proposed for classification, 9 lie entirely within Scottish territorial waters (within 12 nm of the territorial limit). An additional three sites have offshore components and one (Solway Firth pSPA) has cross-border components with England. The location of the pSPAs are shown on Figure 1. Table 1 sets out the pSPAs, alongside their respective qualifying features. These incorporate the changes recommended in SNH and JNCC's Final Advice on the proposed SPA network (see Section 2.3).
- 2.5.5 The pSPAs have been selected in accordance with the 'UK SPA Selection Guidelines'⁵⁰: The pSPAs cover a range of species which use Scottish Waters:
- Inshore wintering waterfowl;
 - Foraging areas for breeding terns;

⁴⁵ SNH (2018) Overview of the Scottish marine Special Protection Area selection process [online] Available at https://www.nature.scot/sites/default/files/2018-09/Overview%20of%20the%20Scottish%20marine%20Special%20Protection%20Area%20selection%20process_1.pdf

⁴⁶ 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)

⁴⁷ SNH (2018). Scottish proposed SPA network assessment - September 2018. Available at: <https://www.nature.scot/scottish-proposed-spa-network-assessment-september-2018> (accessed 13/03/2019).

⁴⁸ Scottish Government (2016) Special Protection Areas in the Marine Environment Q&A [online] Available at: <http://www.gov.scot/Resource/0050/00507009.pdf> (accessed 13/03/2019)

⁴⁹ <https://www.nature.scot/marine-special-protection-areas-final-advice-scottish-government>

⁵⁰ JNCC (1999) SPA selection guidelines [online] Available at: <http://jncc.defra.gov.uk/page-1405> (accessed 24/01/2018)

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

2.5.6 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 species⁵¹.

2.5.7 SPAs that are classified should 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 pSPAs⁵² 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.

⁵¹ 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)

⁵² 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/spaworkshopdocuments> (accessed 01/08/2018)

Figure 1 Marine pSPAs

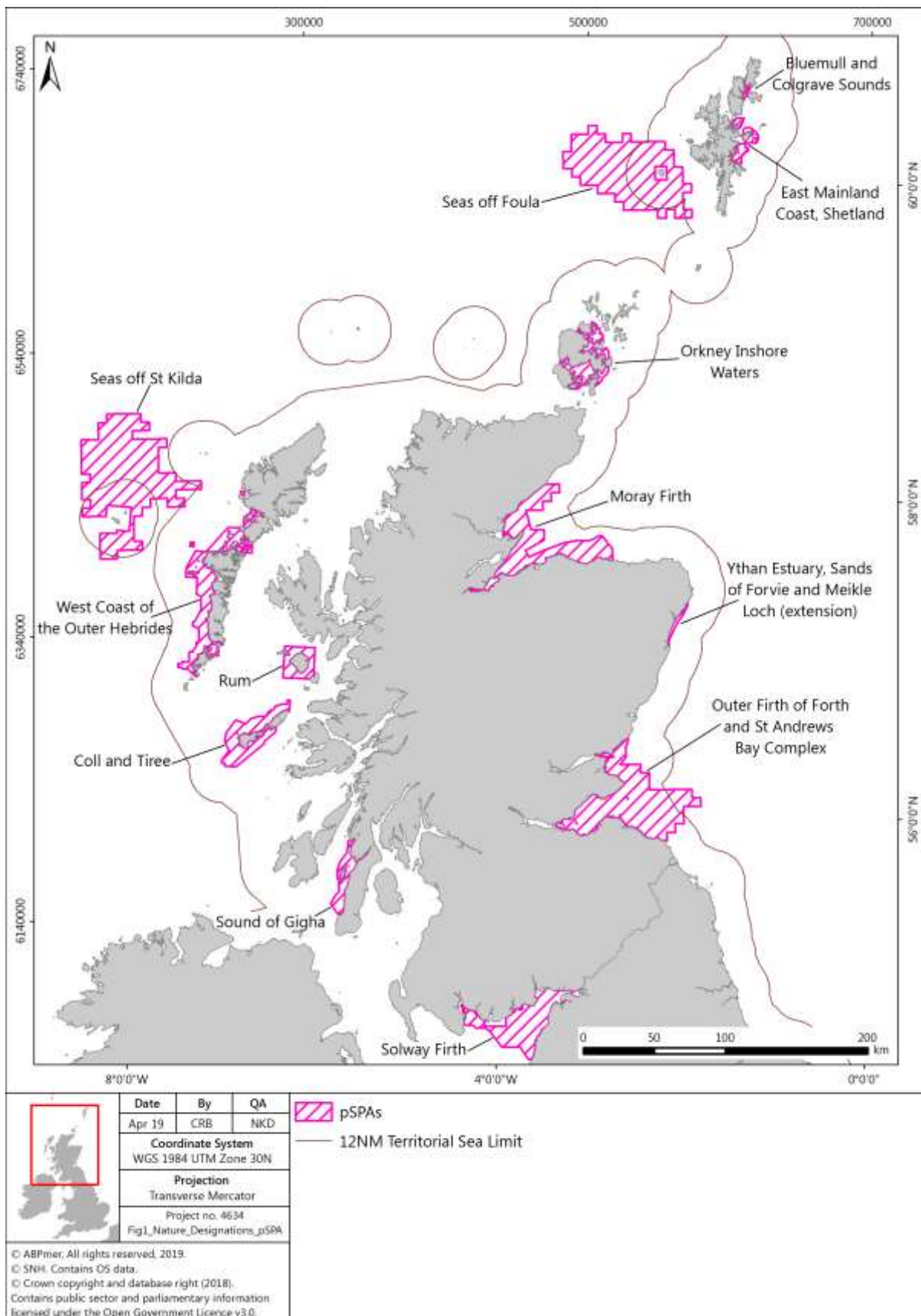


Table 1 Proposed SPAs and their qualifying features

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
<i>Exclusively in Scottish Territorial waters</i>				
1. Bluemull and Colgrave Sounds	Marine waters to the east of northern 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)	<ul style="list-style-type: none"> Red-throated diver (<i>Gavia stellata</i>) 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Provides important feeding grounds for over 190 pairs (15% of the British (GB) population) of breeding red-throated divers, whose breeding range in Great Britain is restricted to Scotland. Supports UK's second largest concentration of foraging red-throated divers during the breeding season and represents northern extent of UK range.
2. Coll and Tiree	Western Inner Hebrides (most of the marine waters between and surrounding the adjacent islands of Coll and Tiree excluding the south-east coast of Coll)	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Common eider (<i>Somateria mollissima</i>) Great northern diver (<i>Gavia immer</i>) 	<ul style="list-style-type: none"> Over 18% of the British (GB) great northern diver population and over 2% of the GB eider population winter here Fourth largest concentration of great northern divers in Scotland and one of three large west coast populations
3. East Mainland Coast, Shetland	Waters east of Shetland, from Samphrey in the north to the north coast of Bressay including waters around Whalsay	<ul style="list-style-type: none"> Red-throated diver (<i>Gavia stellata</i>) 	<ul style="list-style-type: none"> Great northern diver (<i>Gavia immer</i>) Slavonian grebe (<i>Podiceps auritus</i>) 	<ul style="list-style-type: none"> Supports over 7% of the wintering British (GB) great northern diver population as well as large numbers of Slavonian grebes (5% GB non-breeding population)

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
				<ul style="list-style-type: none"> In the summer, provides feeding grounds for over 15% of the GB breeding population of red-throated divers
4. Moray Firth	<ul style="list-style-type: none"> Extends seaward from north of Helmsdale on Caithness coast, to Portsoy East on the Moray coast. Includes the outer Dornoch and Cromarty Firths, Beaully Firth and Inner Moray Firth, as well as part of the outer Moray Firth 	<ul style="list-style-type: none"> European shag (<i>Phalacrocorax aristotelis</i>) 	<ul style="list-style-type: none"> Common eider (<i>Somateria mollissima</i>) Common goldeneye (<i>Bucephala clangula</i>) Common scoter (<i>Melanitta nigra</i>) Great northern diver (<i>Gavia immer</i>) Greater scaup (<i>Aythya marila</i>) Long-tailed duck (<i>Clangula hyemalis</i>) Red-breasted merganser (<i>Mergus serrator</i>) Red-throated diver (<i>Gavia stellata</i>) Slavonian grebe (<i>Podiceps auritus</i>) Velvet scoter (<i>Melanitta fusca</i>) European shag (<i>Phalacrocorax aristotelis</i>) 	<ul style="list-style-type: none"> Attracts one of the largest wintering concentrations of divers and sea ducks in Britain In particular, the site hosts the largest Scottish wintering populations of long-tailed duck, common and velvet scoter, greater scaup and common goldeneye Holds major foraging concentrations of European shag in both breeding and non-breeding seasons, equivalent to c.3% of the biogeographic population
5. Orkney Inshore Waters	<ul style="list-style-type: none"> The site encompasses Scapa Flow and inshore waters of northern 	<ul style="list-style-type: none"> Red-throated diver (<i>Gavia stellata</i>) 	<ul style="list-style-type: none"> Common eider (<i>Somateria mollissima</i>) European shag (<i>Phalacrocorax aristotelis</i>) 	<ul style="list-style-type: none"> One of the most substantial concentrations of non-breeding wintering waterfowl in northern Britain (GB).

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
	South Ronaldsay, Burray and south-east Mainland together with sounds between the islands of Mainland, Shapinsay, Rousay, Egilsay, Wyre, Gairsay and Eynhallow, including Deer Sound, Shapinsay Sound and Wide Firth		<ul style="list-style-type: none"> • Great northern diver (<i>Gavia immer</i>) • Long-tailed duck (<i>Clangula hyemalis</i>) • Red-breasted merganser (<i>Mergus serrator</i>) • Slavonian grebe (<i>Podiceps auritus</i>) • Velvet scoter (<i>Melanitta fusca</i>) • Black-throated diver (<i>Gavia arctica</i>) 	<ul style="list-style-type: none"> • Hosts the largest population of non-breeding Slavonian grebe in Britain (GB) The populations of red-breasted merganser, great northern diver, black-throated diver, long-tailed duck and European shag are the largest or second largest in Scotland • Is an important foraging area for a high concentration of red-throated divers breeding on adjacent islands and Hoy SPA and Orkney Mainland Moors SPA
6. Rum	<ul style="list-style-type: none"> • Island of Rum lies in the Inner Hebrides off the west coast of Scotland • The island is already an SPA, intended to protect breeding red-throated diver, as well as golden eagle, black-legged kittiwake, common guillemot, and Manx shearwater • In 2009, the SPA 	<ul style="list-style-type: none"> • Red-throated diver⁵³ (<i>Gavia stellata</i>) 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • 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. This proposal is to include the foraging grounds of red-throated divers breeding on Rum and Canna.

⁵³ Proposed as an additional marine feature.

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
	<p>was extended into adjacent marine waters (by 4 km) to afford additional protection to in-shore gatherings of Manx shearwater</p> <ul style="list-style-type: none"> The addition of red-throated diver as a qualifying feature to this existing marine extension will protect foraging areas used by divers from the Rum SPA and neighbouring islands 			
7. Sound of Gigha	<ul style="list-style-type: none"> Island of Gigha lies off the west coast of Kintyre peninsula, mainland Scotland Proposed SPA covers waters surrounding Gigha and spans coastal waters from Point of Knap, south to Machrihanish 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Common eider (<i>Somateria mollissima</i>) Great northern diver (<i>Gavia immer</i>) Red-breasted merganser (<i>Mergus serrator</i>) Slavonian grebe (<i>Podiceps auritus</i>) 	<ul style="list-style-type: none"> A major west coast wintering ground for over 20% of the British population of great northern divers (over 500 individuals), along with significant numbers of Slavonian grebe, common eider and red-breasted merganser Represents the south-western part of the wintering ranges of great northern diver and Slavonian grebe in Scotland
8. West Coast of the	<ul style="list-style-type: none"> Includes much of the south west 	<ul style="list-style-type: none"> Red-throated diver (<i>Gavia</i> 	<ul style="list-style-type: none"> Black-throated diver (<i>Gavia arctica</i>) 	<ul style="list-style-type: none"> Supports the largest concen-

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
Outer Hebrides	coast of the Outer Hebrides, running from the island of Scarp, off north-west Harris, along the west coasts of North Uist, Benbecula and South Uist, to the island of Sandray (south of Barra)	<i>stellata</i>)	<ul style="list-style-type: none"> • Common eider (<i>Somateria mollissima</i>) • Great northern diver (<i>Gavia immer</i>) • Long-tailed duck (<i>Clangula hyemalis</i>) • Red-breasted merganser (<i>Mergus serrator</i>) • Slavonian grebe (<i>Podiceps auritus</i>) 	<p>tration of wintering great northern divers in Britain as well as significant numbers of other wintering waterfowl including largest concentrations of common eider, long-tailed duck and red-breasted merganser, and in the north-west of their wintering ranges in GB.</p> <ul style="list-style-type: none"> • Also supports one of just two substantial populations of wintering black-throated divers as well as providing feeding grounds for breeding red-throated divers during the summer months
9. Ythan Estuary, Sands of Forvie and Meikle Loch	<ul style="list-style-type: none"> • Ythan Estuary, Sands of Forvie and Meikle Loch is already an SPA supporting internationally significant numbers of wintering waders and waterfowl and breeding populations of common, Sandwich, and little tern 	<ul style="list-style-type: none"> • Little tern⁵⁴ (<i>Sternula albifrons</i>) • Sandwich tern⁵⁵ (<i>Sterna sandvicensis</i>) 		<ul style="list-style-type: none"> • The marine extension to the existing SPA comprises fairly shallow seas and sandy sediments that support numerous small fish species such as sandeels which both Sandwich and little tern depend upon for food. • The Ythan Estuary, Sands of Forvie and Meikle Loch SPA represents the largest populations of both little and Sandwich terns in the north of their

⁵⁴ This species will receive further protection through the proposed extension of the existing SPA.

⁵⁵ This species will receive further protection through the proposed extension of the existing SPA.

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
	<ul style="list-style-type: none"> The present proposal seeks to extend the SPA into the marine environment to safeguard foraging areas for Sandwich tern and little tern The extension encompasses waters within up to 4 km from the coast stretching from Aberdeen Bay northwards to Cruden Bay 			GB and Scotland range
<i>Contain offshore components</i>				
10. Outer Firth of Forth and St Andrews Bay Complex	<ul style="list-style-type: none"> Stretches from Arbroath to St Abb's Head and covers the outer Firths of Forth, and Tay, including St Andrews Bay together with adjacent marine waters, extending east of the Isle of May 	<ul style="list-style-type: none"> Arctic tern (<i>Sterna paradi-saea</i>) Atlantic puffin (<i>Fratercula arctica</i>) Common guillemot (<i>Uria aalge</i>) Common tern (<i>Sterna hirundo</i>) European shag (<i>Phalacrocorax aristotelis</i>) Herring gull (<i>Larus argentatus</i>) Black-legged kittiwake (<i>Rissa tridactyla</i>) Manx shearwater (<i>Puffinus</i> 	<ul style="list-style-type: none"> Black-headed gull (<i>Chroicocephalus ridibundus</i>) Common eider (<i>Somateria mollissima</i>) Common goldeneye (<i>Bucephala clangula</i>) Common guillemot (<i>Uria aalge</i>) Common gull (<i>Larus canus</i>) Common scoter (<i>Melanitta nigra</i>) European shag (<i>Phalacrocorax aristotelis</i>) 	<ul style="list-style-type: none"> Site of one of Scotland's largest and most diverse marine bird concentrations including: aggregations of inshore wintering waterfowl, foraging aggregations of seabirds in both the breeding and non-breeding seasons, and wintering gulls. Wintering waterfowl populations include over 35% of the common eider and over 23% of the velvet scoter British [GB] populations and largest concentration of red-throated divers in Scotland

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
		<ul style="list-style-type: none"> <i>puffinus</i>) Northern gannet (<i>Morus bassanus</i>) Seabird assemblage 	<ul style="list-style-type: none"> Herring gull (<i>Larus argentatus</i>) Black-legged kittiwake (<i>Rissa tridactyla</i>) Little gull (<i>Hydrocoloeus minutus</i>) Long-tailed duck (<i>Clangula hyemalis</i>) Razorbill (<i>Alca torda</i>) Red-breasted merganser (<i>Mergus serrator</i>) Red-throated diver (<i>Gavia stellata</i>) Slavonian grebe (<i>Podiceps auritus</i>) Velvet scoter (<i>Melanitta fusca</i>) Waterfowl assemblage Seabird assemblage 	<ul style="list-style-type: none"> Similarly, more than 1% of the GB populations of multiple seabird species aggregate in the area over the summer, including gannets, black-legged kittiwakes, Atlantic puffins, common guillemots and terns Notable aggregations of seabirds in the winter include four species of gull, razorbill, common guillemot, black-legged kittiwake and European shag. The aggregations of black-legged kittiwakes in both breeding and non-breeding seasons and of common guillemot and Atlantic puffin in the breeding season are the largest known in UK waters.
11. Seas off Foula	<ul style="list-style-type: none"> Foula and its immediate waters are already protected by the Foula SPA The proposed Seas off Foula SPA lies adjacent to the existing SPA extending the protection into the foraging grounds. 	<ul style="list-style-type: none"> Arctic skua (<i>Stercorarius parasiticus</i>) Atlantic puffin (<i>Fratercula arctica</i>) Common guillemot (<i>Uria aalge</i>) Great skua (<i>Stercorarius skua</i>) Northern fulmar (<i>Fulmarus glacialis</i>) Seabird assemblage 	<ul style="list-style-type: none"> Common guillemot (<i>Uria aalge</i>) Great skua (<i>Stercorarius skua</i>) Northern fulmar (<i>Fulmarus glacialis</i>) Seabird assemblage 	<ul style="list-style-type: none"> Island of Foula hosts more than 190,000 breeding seabirds, one of the largest and most well-established seabird colonies in Britain. In particular, Foula holds the largest (breeding great skua population in Britain, and the marine aggregation of great skuas in the surrounding seas is the largest in UK waters.

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
12. Seas off St. Kilda	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Atlantic puffin (<i>Fratercula arctica</i>) • Common guillemot (<i>Uria aalge</i>) • European storm-petrel (<i>Hydrobates pelagicus</i>) • Northern fulmar (<i>Fulmarus glacialis</i>) • Northern gannet (<i>Morus bassanus</i>) • Seabird assemblage 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • The St Kilda archipelago holds the most important gannetry in the UK together with the most important breeding colonies of northern fulmar and Atlantic puffin in Britain. • The importance of these colonies is reflected in the very large multispecies seabird aggregation in the surrounding waters, which includes the largest concentration of breeding northern gannet in UK waters with over 50,300 birds

Site name	Location	Qualifying features		Characteristics
		Breeding	Non-breeding	
<i>Contain cross-border components with England</i>				
13. Solway Firth	<ul style="list-style-type: none"> The Solway Firth pSPA is a large estuarine/marine site situated between the western coastal margins of Cumbria in England and Dumfries and Galloway in Scotland, off the west coast of Great Britain. It is one of the largest estuaries in the UK along with Morecambe Bay and the Wash. The Solway Firth (including the classified Upper Solway Flats and Marshes SPA and the proposed marine extension) supports populations of Annex 1 species of European importance and migratory populations of European importance. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Common scoter⁵⁶ (<i>Melanitta nigra</i>) Goosander⁵⁷ (<i>Mergus merganser</i>) Red-throated diver⁵⁸ (<i>Gavia stellata</i>) Black-headed gull⁵⁹ (<i>Chroicocephalus ridibundus</i>) Common gull⁶⁰ (<i>Larus argentatus</i>) Herring gull⁶¹ (<i>Larus argentatus</i>) Lapwing⁶² (<i>Vanellus vanellus</i>) Redshank⁶³ (<i>Tringa totanus</i>) Cormorant⁶⁴ (<i>Phalacrocorax carbo</i>) 	<ul style="list-style-type: none"> 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

⁵⁶ Common scoter is a new species included in the proposed marine extension. Further, it is a named water bird assemblage qualifier.

⁵⁷ Goosander is a new species included in the proposed marine extension. Further, it is a named water bird assemblage qualifier.

⁵⁸ Red-throated diver is a new species included in the proposed marine extension.

⁵⁹ Black-headed gull is a proposed addition to the existing part of the SPA. Further, it is a named water bird assemblage qualifier.

⁶⁰ Common gull is a proposed addition to the existing part of the SPA. Further, it is a named water bird assemblage qualifier.

⁶¹ Herring gull is a proposed addition to the existing part of the SPA. Further, it is a named water bird assemblage qualifier.

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.

2.6 Policy context of marine SPAs

- 2.6.1 Both the 2005 Act and the 2004 Regulations require Responsible Authorities to identify the broader policy context in which the plan or policy is situated and any environmental protection objectives that will influence its development and implementation.
- 2.6.2 The overall policy context of the preferred policy recommendation to classify 13 pSPAs 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.
- 2.6.3 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 3.3) is included in Appendix B.

MPA network

- 2.6.4 In addition to being legal requirements under the Birds Directive and Habitats Directive, respectively, marine SPAs and SACs are examples of a Marine Protected Areas (MPAs) in Scotland, others are Ramsar Sites, Nature Conservation MPAs, Demonstration and Research MPAs, Historic MPAs, and Sites of Special Scientific Interest (SSSIs)⁶⁵. 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 users⁶⁶.
- 2.6.5 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 2008/56/EC⁶⁷. They also form part of the OSPAR Convention network of protected sites found throughout the north-east Atlantic Ocean⁶⁸.

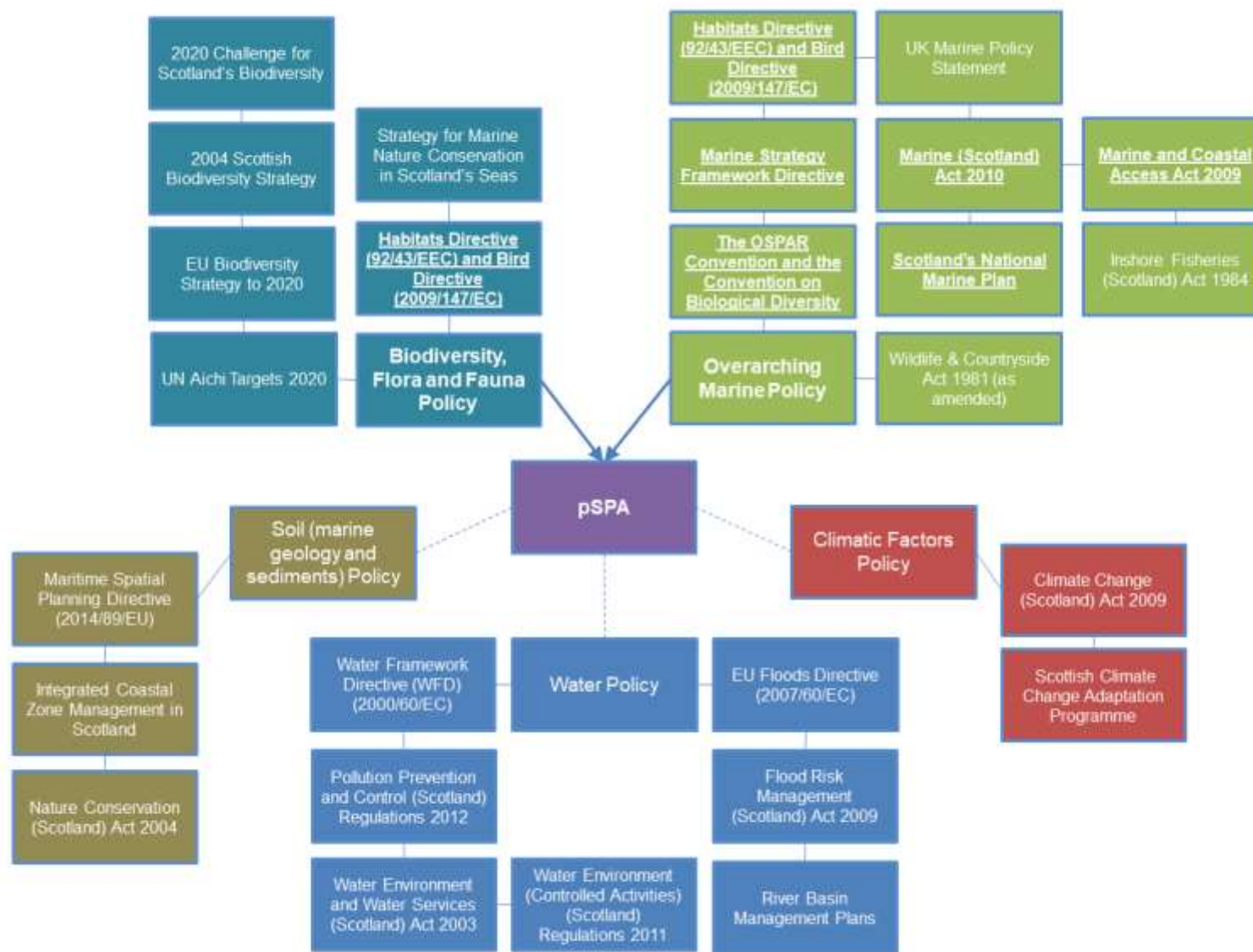
⁶⁵ Scottish Government (2017) Marine Protected Areas (MPAs) [online] Available at: <http://www.gov.scot/Topics/marine/marine-environment/mpanetwork> (accessed 24/01/2018)

⁶⁶ *ibid*

⁶⁷ 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)

⁶⁸ *ibid*

Figure 2 pSPAs: Policy context



3 Approach to the Assessment

3.1 Updates to the 2018 Environmental Report

3.1.1 Key updates in this section are to the methodology for the assessment of reasonable alternatives in Section 3.6 which has been updated in line with the new set of reasonable alternatives developed by Marine Scotland to address the consultation responses on the 2018 Environmental Report.

3.2 Purpose of the Assessment

3.2.1 The purpose of this SEA is to assess the potential for likely significant environmental effects that may arise from the updated preferred policy recommendation to classify 13 pSPAs, and the expanded set of reasonable alternatives. This will allow corresponding mitigation measures to be identified where appropriate and highlight opportunities for enhancement in cases where beneficial effects are likely.

3.2.2 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 themselves be subject to further consideration under the 2005 Act.

3.3 Scope of the Assessment

3.3.1 The scope of this assessment covers the potential effects of designating the pSPAs under the preferred policy recommendation, described in Section 2.5, and the potential effects of the reasonable alternatives described under Section 3.6.

3.3.2 An initial review of the environmental topics set out in Schedule 3 of the 2005 Act⁶⁹ 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. The screening and scoping process undertaken previously, to inform the 2018 Environmental Report, is considered to remain valid and is carried forward into this updated Environmental Report.

3.3.3 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

⁶⁹ 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)

of the Birds Directive. This information is contained within separate documents and the process for site selection undertaken is described in Section 2.5.

- 3.3.4 Additionally, based on a Socio-Economic Impact Assessment (SEIA) undertaken for the pSPAs, 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. The results of these are reported separately and are not within the scope of this assessment.

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 ⁷⁰ . 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

⁷⁰ 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
		proposed that the potential impact of the pSPAs on 'Climatic Factors' as they relate to carbon sequestration and blue carbon 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 future 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/Sea scape	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.

3.4 Assessment methods

- 3.4.1 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.
- 3.4.2 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.
- 3.4.3 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	<ul style="list-style-type: none">▪ 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	<ul style="list-style-type: none">▪ To maintain and protect the character and integrity of the seabed including avoidance of pollution of the seabed strata/seabed sediments.
Water	<ul style="list-style-type: none">▪ To maintain or work towards achieving good ecological status under the WFD or good environmental status under the MSFD.
Climatic Factors	<ul style="list-style-type: none">▪ To preserve and enhance existing marine carbon stocks and carbon sequestration potential.

- 3.4.4 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 potential changes that may result from the recommended options for managing non-licensable activities (i.e. fishing) within the pSPAs have also been assessed drawing from the ‘Advice to Support Management’ documents⁷¹ (Table 2). These recommended management options are considered for indicative purposes and do not constrain future decisions or represent the final management measures that may be adopted by the Scottish Government for individual sites. Any specific management measures that are subsequently

⁷¹ 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/spaworkshopdocuments> (accessed 01/08/2018)

required to meet the objectives of the pSPAs will be subject to further consideration under the 2005 Act and are likely to require their own SEA.

- 3.4.5 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 scale of changes, feature sensitivities, the baseline environment and expert judgement.
- 3.4.6 Of the 13 pSPAs proposed to be classified, 9 lie entirely within Scottish territorial waters (within 12 nm of the territorial limit). An additional three sites have offshore components and one (Solway Firth pSPA) has cross-border components with England. As such, the assessment has considered the potential for cross-border impacts.

3.5 Building on Previous Assessments

3.5.1 The classification and management of the pSPAs is similar to the designation and management of Nature Conservation MPAs in that both contribute to Scotland’s MPA network. As such, this SEA builds on the approach used in the SEAs of relevant marine conservation work undertaken by the Scottish Government, specifically:

- The designation of the first round of Nature Conservation MPAs (assessed in 2013)⁷²;
- Phase one (assessed in 2014)⁷³ and proposals for phase two (currently under assessment) of the implementation of MPA management measures; and
- Proposals for four additional pMPAs⁷⁴ (currently under assessment); and
- Proposals for management measures applying to PMFs outside the MPA network⁷⁵ (currently under assessment).

3.5.2 The assessment methodology applied in this SEA has been informed by these previous and ongoing assessments in order to help ensure a consistent approach is undertaken. The concurrent assessments that are being undertaken for the ongoing SEA work have been used to inform the current assessment as far as

⁷² 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/Publications/2013/08/2591/0> (accessed 18/10/2018)

⁷³ Scottish Government (2014) Proposals for statutory management measures in Marine Protected Areas and Special Areas of Conservation Environmental Report Addendum. November 2014. Available at: <https://www2.gov.scot/Resource/0046/00464215.pdf> (accessed 18/10/2018)

⁷⁴ Scottish Government (2019) Proposals for four new marine protected areas, Consultation overview. Will be available at https://consult.gov.scot/marine-scotland/four-new-marine-protected-areas/start_preview?token=d00e7ed92228742994f8c9b273771286855834cc

⁷⁵ Scottish Government (2019) Proposals for priority marine features, Consultation overview. Will be available at: <https://consult.gov.scot/marine-scotland/priority-marine-features/>

possible, providing a more complete understanding of cumulative effects in particular.

- 3.5.3 Other relevant sources of information include the SEAs undertaken on the draft Sectoral Marine Plans for Offshore Renewable Energy in Scottish Waters⁷⁶, the Offshore Wind Sectoral Marine Plan Scoping Report⁷⁷ and ongoing SEA of the updated Offshore Wind Sectoral Marine Plan.

3.6 Reasonable alternatives

- 3.6.1 The preferred policy recommendation for Scottish Ministers is to classify the additional pSPAs as described in Section 2.5, as this is considered to be the most robust way of meeting the objective of fulfilling the statutory obligations of the Birds Directive (see Section 2.4). The 2005 Act requires that the likely significant effects on the environment of any Reasonable Alternatives to the preferred policy recommendation are identified, described and evaluated, taking into account the objectives and geographical scope of the plan or programme.
- 3.6.2 A new set of four SEA Reasonable Alternatives have been developed by Marine Scotland to address the comments made by respondents to the Environmental Report that was published for consultation in 2018⁷⁸. These Reasonable Alternatives, which supersede those assessed under the September 2018 consultation, are considered 'reasonable' in terms of the 2005 Act as they meet the objective of classifying the pSPAs in order to fulfil statutory obligations under the Birds Directive.
- 3.6.3 Each of the four SEA Reasonable Alternatives are described in detail below. Compared to the preferred policy recommendation the first two of the SEA Reasonable Alternatives would provide a greater level of provision for the bird species, and the third and fourth would provide a reduced level of provision. Table 5 presents the number of qualifying features within each pSPA under the preferred policy recommendation and each of the SEA Reasonable Alternatives. Appendix A of the consultation document⁷⁹ provides further information on the pSPAs, including the qualifying features within each pSPA under each of the SEA Reasonable Alternatives.
- 3.6.4 **SEA Reasonable Alternative 1**- this alternative also classifies all 13 pSPAs that form the Final Advice from SNH and JNCC, but the qualifying interests would be all species that regularly occur in qualifying numbers. This would result in two additional qualifying interests at East Mainland Coast, Shetland pSPA: long-

⁷⁶ 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 18/10/2018)

⁷⁷ Scottish Government (2018) Offshore Wind Sectoral Marine Plan Scoping Consultation [online] Available at: <https://consult.gov.scot/marine-scotland/offshore-wind-scoping/> (accessed 18/10/2018)

⁷⁸ Scottish Government (2018). Consultation on the Strategic Environmental Assessment for 15 proposed Special Protection Areas. Available at: <https://consult.gov.scot/marine-scotland/sea-for-15-proposed-special-protection-areas/> (accessed 13/03/2019).

⁷⁹ Scottish Government (2019) <https://consult.gov.scot/marine-scotland/sea-and-site-classification/>

tailed duck and red-breasted merganser, but in all other respects the network of sites would be the same as the preferred policy option based on SNH's Final Advice. However, in addition this Reasonable Alternative would identify conservation measures, including Priority Marine Feature (PMF) status for some species to further enhance conservation benefits.

- 3.6.5 The Network Assessment identified a number of species where additional conservation measures would be beneficial. No bird species have PMF status at the present time, and its provision would give additional consideration for listed PMF species in the planning and consenting systems. This scenario meets the objective of fulfilling the statutory requirements of the Birds Directive however it includes a higher level of representation of some species in the network than considered necessary as well as PMF status which goes beyond what is statutorily required.
- 3.6.6 In the previous 2018 Environmental Report the High Scenario Reasonable Alternative (which SEA Reasonable Alternative 1 replaces) included another positive conservation measure to develop a Scottish Seabird Conservation Strategy. In the intervening period this has become a Programme for Government commitment meaning this measure no longer forms part of the Alternatives assessed under this report.
- 3.6.7 **SEA Reasonable Alternative 2-** This alternative also classifies all 13 pSPAs with all species that regularly occur in qualifying numbers. The qualifying interests of the sites are the same as for Reasonable Alternative 1.
- 3.6.8 SEA Reasonable Alternative 2 considers the pSPAs and qualifying features contained in SEA Reasonable Alternative 1 but would not include PMF status for marine bird species. Neither is PMF status considered in the subsequent SEA Reasonable Alternatives. This SEA Reasonable Alternative meets the objective of fulfilling the statutory requirements of the Birds Directive. However, as with SEA Reasonable Alternative 1, it includes a higher level of representation of species in the network than is considered necessary to meet the objective of fulfilling statutory obligations for SPA classification under the Birds Directive.
- 3.6.9 **SEA Reasonable Alternative 3-** This would provide a reduced provision for the bird species compared to the preferred policy recommendation by removing the qualifying status of breeding red-throated diver from neighbouring marine pSPAs.
- 3.6.10 This SEA Reasonable Alternative reduces local geographic replication of breeding red-throated diver in the marine SPAs. Under this Alternative the number of marine SPA's with breeding red-throated diver as a qualifying feature would be limited to one in Orkney and one in the Shetland. This would result in the Bluemull and Colgrave Sound pSPA not being classified reducing the proposed network to 12 sites. If North Orkney pSPA and Scapa Flow pSPA are taken forward, this scenario would also result in the removal of breeding red-throated diver as a qualifying feature from the North Orkney pSPA (see Section 6 below).

- 3.6.11 A limitation of SEA Reasonable Alternative 3 is that it does not reflect the highly restricted distribution of breeding red-throated diver in Scotland. Scotland supports all of the GB breeding population of red-throated diver (an Annex 1 species identified as rare and vulnerable in the Birds Directive) with the Northern Isles supporting over 40% of this. A reduction on the basis of local geographic replication would result in the second and fourth largest SPA populations not being included in the UK SPA network. In addition, both pSPAs provide protection to feeding grounds used by red-throated diver from terrestrial SPAs.
- 3.6.12 There is the potential that this SEA Reasonable Alternative would result in more needing to be done to adapt the network in the future to meet the favourable conservation status needs of species that are less well represented.
- 3.6.13 **SEA Reasonable Alternative 4-** would reduce replication in the Scottish network for species already well represented in the existing UK marine SPA network and where the majority of their population is not in Scotland.
- 3.6.14 Under this SEA Reasonable Alternative for species where Scotland holds the majority of the population (taken as >50% GB population), the findings on the Network Assessment with respect to the existing level of representation for each species in the Scottish marine SPA network is relevant and appropriate at a UK level and therefore, further reduction in the Scottish network is not considered appropriate. For species where Scotland does not support the majority of the population and where there is already existing UK SPA provision the number of Scottish SPAs for which these species are identified as qualifying features could be reduced. This SEA Reasonable Alternative presents the same limitation as SEA Reasonable Alternative 3 with respect to breeding red-throated diver. In addition, non-breeding red-throated diver would be removed as a qualifying feature from the Moray Firth pSPA and common scoter and black-headed gull from the Solway Firth pSPA.
- 3.6.15 In addition to the limitations around breeding red-throated diver, there are a number of factors that affect how replication at the UK scale is accounted for. Key to this is the requirement under the Birds Directive to provide SPAs for the conservation of species in the geographical seas where they occur. This is accounted for in the UK SPA Selection Guidelines under Stage 2.2 which prioritises selection of areas to those for a given species in the UK that 'provide as wide a geographic coverage across the species' range as possible'. This means we would expect to have the full geographic range of a species (based on its UK distribution) in the UK represented in a UK marine SPA network. This scenario does not 'provide as wide a geographic coverage across the species' range as possible' and would result in no SPA provision of non-breeding red-throated diver in the northern extent of its GB range and no SPA provision of common scoter and black-headed gull in the northwest extent of their range.
- 3.6.16 There is the potential that this SEA Reasonable Alternative will result in more needing to be done to adapt the network in the future to meet the favourable conservation status needs of species that are less well represented.

Table 5 Number of qualifying features within each pSPA under each SEA Reasonable Alternative

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	Preferred Policy Recommendation	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
Bluemull & Colgrave Sounds	1	1	1	0 pSPA would not be classified	0 pSPA would not be classified
East Mainland Coast, Shetland	5	5	3	3	3
Seas off Foula	8	8	8	8	8
Orkney Inshore Waters (Option 1)	9	9	9	9	9
North Orkney (Option 2)	8	8	4	3	3
Scapa Flow (Option 2)	8	8	8	8	8
Moray Firth	12	12	12	12	11
Ythan Estuary, Sands of Forvie and Meikle Loch	2	2	2	2	2
Outer Firth of Forth and St Andrews Bay Complex	25	25	25	25	25
Solway Firth	6	6	6	6	4
Sound of Gigha	4	4	4	4	4
Coll & Tiree	2	2	2	2	2
Rum	1	1	1	1	1

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	Preferred Policy Recommendation	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
West Coast of Outer Hebrides	7	7	7	7	7
Seas off St Kilda	3	3	3	3	3
Species considered for additional conservation measures (including PMF status)	34	0	0	0	0

Other potential alternatives not considered further

- 3.6.17 The following reasonable alternatives were suggested by some respondents to the September 2018 consultation:
- No designations; and
 - Designating alternative areas to those proposed.
- 3.6.18 ‘No designations’ (i.e. maintaining the status quo and not classifying the pSPAs) would not meet the objective of the plan in terms of fulfilling statutory obligations under the Birds Directive. It is therefore not considered to be a ‘reasonable alternative’ in terms of the 2005 Act.
- 3.6.19 ‘Designating alternative areas to those proposed’ has already been considered by SNH and JNCC and rejected as part of the site selection process, as detailed in the ‘Overview of the Scottish marine Special Protection Area selection process’⁸⁰ document. This document outlines the process of selecting the “most suitable territories” for SPAs, as required by the Birds Directive and provides information on why alternative areas were considered not to be the “most suitable territories”. For this reason, designating alternative areas is not considered to be a ‘reasonable alternative’ under the 2005 Act.

The option to classify either 2 SPAs or 1 SPA in Orkney waters

- 3.6.20 The 2016/17 public consultation on the 15 pSPAs included two pSPAs located off Orkney mainland: North Orkney pSPA and Scapa Flow pSPA. In recognition of the potential complexities of future management of two neighbouring SPAs supporting near identical qualifying species, Marine Scotland requested further advice from SNH and JNCC on the option to take forward a single combined SPA covering both pSPA locations, provided this did not compromise the scientific case or site selection process.
- 3.6.21 The re-analysis of the high density areas and population estimates for a combined SPA confirmed the underpinning scientific data would not be compromised and therefore, both approaches are equally scientifically valid. Marine Scotland, in agreement with SNH, consider there is a case to rationalise the two pSPAs to aid future management. This presents two options for classification:
- Option 1: Classify Orkney Inshore Waters pSPA; and
 - Option 2: Classify North Orkney pSPA and Scapa Flow pSPA.
- 3.6.22 This updated Environmental Report considers the Orkney Inshore Waters pSPA to be the preferred policy recommendation. The potential environmental effects of each of the SEA Reasonable Alternatives for classifying Orkney Inshore Water

⁸⁰ SNH (2018). Overview of the Scottish marine Special Protection Area selection process. Available at: https://www.nature.scot/sites/default/files/2018-09/Overview%20of%20the%20Scottish%20marine%20Special%20Protection%20Area%20selection%20process_1.pdf (accessed 13/03/2019).

pSPA (option 1) have been assessed against the preferred policy recommendation for that option. The potential environmental effects of each of the SEA Reasonable Alternatives for classifying North Orkney pSPA and Scapa Flow pSPA (option 2) have also been assessed against the preferred policy recommendation for that option.

3.6.23 If the option to classify North Orkney pSPA and Scapa Flow pSPA is taken forward, then the qualifying status of the following species would be removed from North Orkney pSPA but remain as qualifying features in Scapa Flow pSPA:

- Common eider *mollissima* subspecies (non-breeding);
- Long-tailed duck (non-breeding);
- Red-breasted merganser (non-breeding); and
- European Shag (non-breeding).

3.6.24 Under SEA Reasonable Alternatives 1 and 2, the number of qualifying features associated with either option would be unaffected.

3.6.25 Under SEA Reasonable Alternatives 3 and 4 breeding red-throated diver would remain a qualifying feature of the Orkney Inshore Waters pSPA (option 1), and would also remain a qualifying feature at Scapa Flow pSPA but would be removed as a qualifying feature at North Orkney pSPA (option 2).

4 Environmental Baseline

4.1 Updates to the 2018 Environmental Report

4.1.1 Updates within the Environmental Baseline section are minor and designed to updating the report to increase clarity to support interpretation of the environmental assessment.

4.2 Introduction

4.2.1 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; soil (geodiversity); water (the ecological status of water bodies), and climatic factors (including carbon cycling, storage and sequestration), reflecting the scope of the assessment as described in Section 3.3.

4.2.2 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.

4.2.3 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.

4.2.4 Scotland's territorial seas are those found up to 12 nautical miles from the coast, they cover a total area of 90,404 km². Beyond these 12 miles and out to the limits of the Exclusive Economic Zone, which is the zone where Scotland claims exclusive rights to economic activities, are a further 371,859 km² of Scottish waters. Scottish waters combined total of 462,263 km² is approximately six times greater than the area of the Scottish mainland and islands added together.

4.3 Biodiversity, flora and fauna

4.3.1 Scotland's seas are positioned between subpolar and subtropical influences and support a spectacular and diverse range of habitats and species. There remains much to be discovered about Scottish marine wildlife, but current best estimates suggest there are tens of thousands of species, from microscopic plants and animals to seals, dolphins and whales.

Marine habitats

4.3.2 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

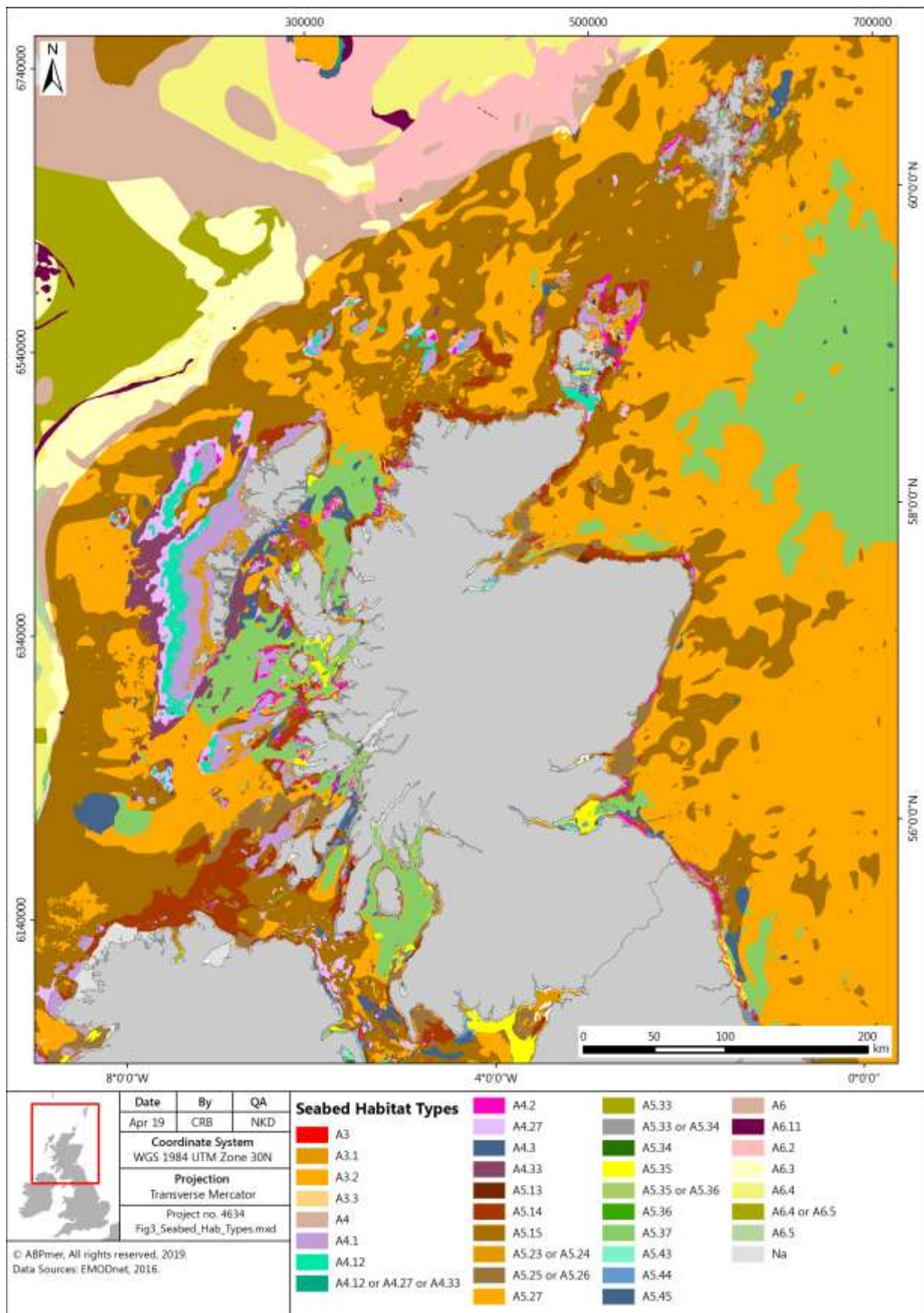
fine clay, with coarser sediments in shallower water and on banks and seamounts⁸¹.

- 4.3.3 The latest information on predicted seabed habitats is provided by the National Marine Plan Interactive (NMPi)⁸² and EMODnet 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).

⁸¹ UK Marine Monitoring and Assessment Strategy (UKMMAS) (2010) Charting Progress 2: An assessment of the state of UK seas.

⁸² National Marine Plan interactive (NMPi). Available at <http://www.scotland.gov.uk/topics/marine/seamanagement/nmpihome> (accessed 25/01/2018)

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

4.3.4 Scotland's marine environment supports a wide range of mobile species with several populations considered to be either of international or national importance. Mobile species in Scottish seas include the following groups:

- Seals (grey and harbour seal);
- 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, as discussed further below);
- Sharks and rays, including basking shark and common skate;
- Commercial fish and shellfish; and
- European otter.

Birds

4.3.5 Scotland, and its coastline, is important for marine and coastal birds, including seabirds, seaducks, divers, grebes, waders and other waterbirds. 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 coasts⁸³.

4.3.6 Seabirds respond to a range of factors, such as changes in food availability, weather, predation and pollution. Breeding abundance and productivity is

⁸³ Scottish Government, 2011, Scotland's Marine Atlas: Information for the National Marine Plan.

assessed for a number of the species that breed in Scotland based on a representative sample of colonies around Scotland, which are monitored as part of the UK Seabird Monitoring Programme⁸⁴. Scotland's coastal breeding seabird population numbers are presented in Table 6, alongside UK total population numbers and estimated UK population trends.

Table 6 Scottish (and UK) Coastal Breeding Seabird Populations

Species	Scottish Population ¹	UK Population ¹	Latest UK Population Trend ²
Northern fulmar <i>Fulmarus glacialis</i>	485,852	501,609	-
Manx shearwater <i>Puffinus</i>	126,545	299,678	n/a
European storm-petrel <i>Hydrobates pelagicus</i>	21,370	25,650	n/a
Leach's storm-petrel <i>Oceanodroma leucorhoa</i>	48,047	48,047	n/a
Northern gannet ³ <i>Morus bassanus</i>	182,511	218,546	+
Great cormorant ⁴ <i>Phalacrocorax carbo</i>	3,626	8,884	-
European shag <i>Phalacrocorax aristotelis</i>	21,487	26,565	-
Arctic skua <i>Stercorarius parasiticus</i>	2,136	2,136	-
Great skua <i>Catharacta skua</i>	9,634	9,634	+
Black-headed gull ⁴ <i>Larus ridibundus</i>	6,888	77,324	+
Common gull ⁴ <i>Larus canus</i>	20,467	20,883	n/a
Lesser black-backed gull ⁴ <i>Larus fuscus</i>	21,565	87,413	n/a
Herring gull ⁴ <i>Larus argentatus</i>	71,659	130,228	n/a
Great black-backed gull ⁴ <i>Larus marinus</i>	14,773	16,735	-
Black-legged kittiwake <i>Rissa tridactyla</i>	282,213	378,847	-
Sandwich tern <i>Sterna sandvicensis</i>	1,068	12,490	+
Roseate tern ⁵ <i>Sterna dougallii</i>	5	107	+
Common tern <i>Sterna hirundo</i>	4,784	11,838	-
Arctic tern <i>Sterna paradisaea</i>	47,306	53,380	+
Little tern <i>Sterna albifrons</i>	331	1,927	-
Common guillemot ⁶ <i>Uria aalge</i>	1,167,841	1,416,334	+
Razorbill ⁵ <i>Alca torda</i>	139,186	187,052	+
Black guillemot ⁷ <i>Cephus grille</i>	37,505	38,714	n/a
Atlantic puffin <i>Fratercula arctica</i>	493,042	580,714	n/a

⁸⁴ ibid

Species	Scottish Population ¹	UK Population ¹	Latest UK Population Trend ²
¹ Most figures are from the Seabird 2000 survey (1998-2002) ⁸⁵ apart from Northern gannet and roseate tern which include more recent updates. All counts are of pairs unless otherwise stated. ² Latest (2015) estimate of UK trend in population change since the Seabird 2000 survey: increase (+), decline (-), insufficient data (n/a) ⁸⁶ . ³ Northern gannet figures are from the complete UK and Ireland survey of colonies in 2003-2005 ⁸⁷ . ⁴ Coastal component ⁵ Roseate tern figures are from 2006 ⁸⁸ . ⁶ Counts are of individuals. ⁷ Counts of pre-breeding adults.			

4.3.7 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 predominantly piscivores or in some cases insectivores, preying on a variety of small fish such as clupeids, sandeel and small gadoids by undertaking pursuit diving.

4.3.8 Important populations of other wintering and passage waterbirds are recorded in estuaries and sheltered coastal sites in Scotland (Table 7). 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 7 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

⁸⁵ 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.

⁸⁶ JNCC. (2016). Seabird Population Trends and Causes of Change: 1986-2015 Report (<http://jncc.defra.gov.uk/page-3201>). Joint Nature Conservation Committee. Updated September 2016.

⁸⁷ 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.

⁸⁸ Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

⁸⁹ Frost, T.M., Austin, G.E., Calbrade, N.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. and Balmer, D.E. (2018). Waterbirds in the UK 2016/17: 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
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
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, turnstone
North Sutherland Coastal Islands	Barnacle goose
Switha	Barnacle goose
East Sanday Coast	Bar-tailed godwit, purple sandpiper, turnstone

4.3.9 A total of 41 bird species have been identified as qualifying features found within the pSPAs. Of these, 11 are Annex I species identified/considered under the Birds Directive as 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 habitat⁹¹.

Protected habitats and species

4.3.10 The importance of Scotland's marine ecosystems is reflected in the range of designations that protect them at international and national levels. All designations are included and incorporated into Scotland's Marine Protected Area Network covering approximately 22% of Scottish seas. The current

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.

designations, as shown in Figure 4 with the exception of SSSI and Ramsar sites, are:

- Special Areas of Conservation (SAC): these include both inshore and offshore SAC and cover eleven different marine habitat types which occur in Scotland (namely 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 (namely 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

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

4.3.12 Currently there are 18 MPAs designated for nature conservation purposes under the Marine (Scotland) Act 2010 and 37⁹² SACs designated under the EU Habitats Directive located within territorial waters (i.e. within 12 nm of the territorial baseline) (Figure 4). A further 13 MPAs and 11 SACs are designated in the offshore environment⁹³ (i.e. from 12 nm from the territorial baseline, or within non-territorial waters).

4.3.13 There are 45 current marine 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 65 SSSI for the further protection of species such as seabirds and seals and habitats ranging from sea caves and rocky shores⁹⁴. There are also 51 Ramsar sites in Scotland designated as internationally

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 27/03/2019)

important wetlands, covering a total area of about 313,000 hectares⁹⁵, of which 16 form part of the MPA network⁹⁶.

- 4.3.14 The Habitats Directive also affords protection to certain species of plants and animals (European Protected Species). In the marine environment these include cetaceans and otter.

Priority marine features

- 4.3.15 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 Scotland⁹⁷. Most are a subset of species and habitats identified on national, UK or 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*”⁹⁸.
- 4.3.16 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). There are no bird species on the list of PMFs.
- 4.3.17 Although many PMFs are protected within the MPA network, there is a need to ensure adequate protection of PMFs outwith the MPA network. Management measures have therefore been proposed in 11 of the most vulnerable PMFs and these are currently being assessed as part of a separate SEA (see Section 3.4).

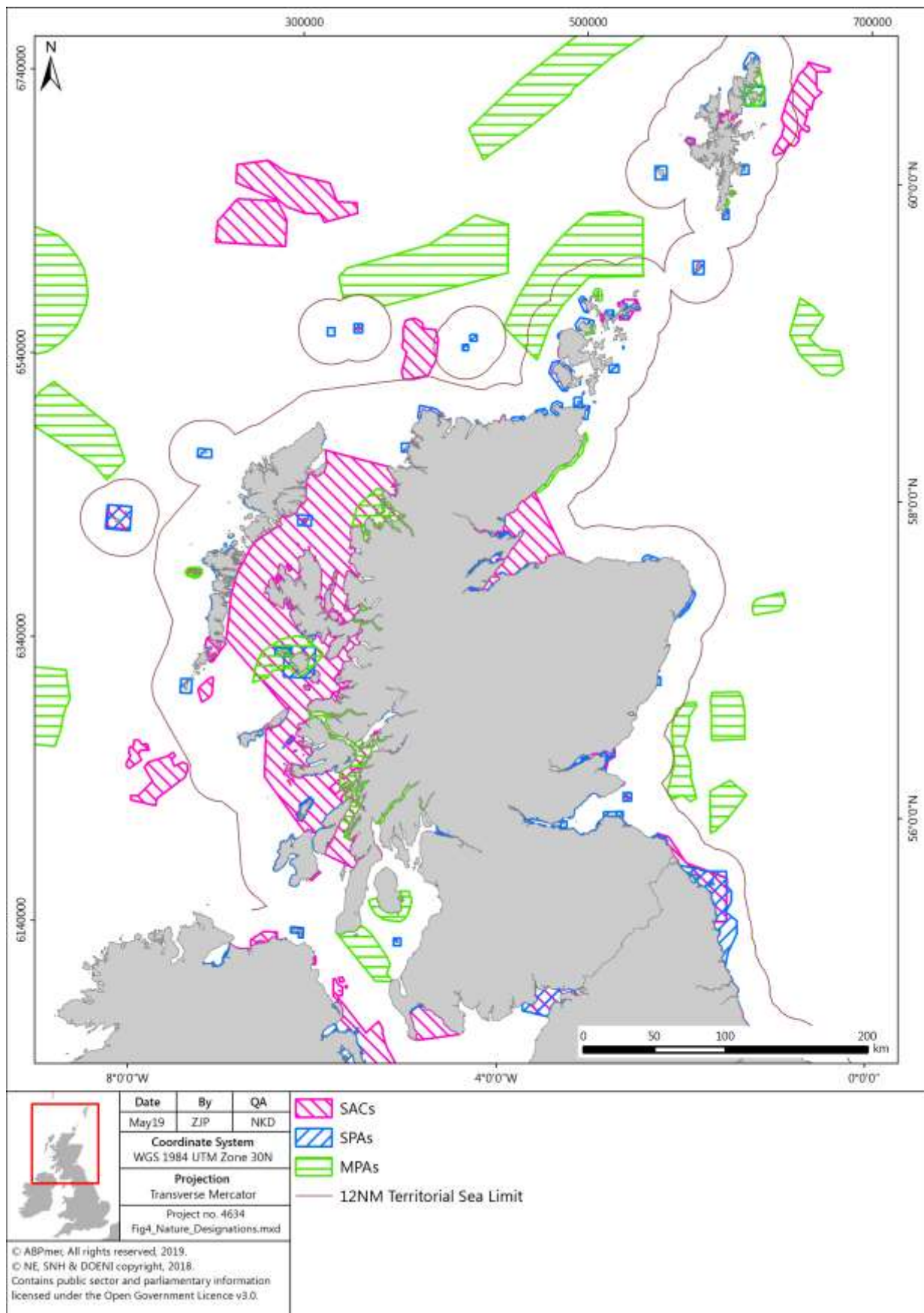
⁹⁵ SNH (2018) Ramsar Sites [online] Available at: <https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/international-designations/ramsar-sites> (accessed 19/11/2018)

⁹⁶ Scottish Government (2018) Marine Protected Areas (MPAs) [online] Available at: <http://www.gov.scot/Topics/marine/marine-environment/mpanetwork> (accessed 27/03/2019)

⁹⁷ 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)

⁹⁸ 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 current marine nature conservation designations



Trends and pressures

- 4.3.18 Within the marine environment there are a number of pressures on biodiversity, flora and fauna. This includes pressures on bird species and the wider environment. 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 activity⁹⁹. It was based on scientific evidence from available data and analysis, supported by expert judgement and taking account of key data gaps¹⁰⁰.
- 4.3.19 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.
- 4.3.20 The Marine Atlas also assessed the condition of the following groups: plankton, cetaceans, grey seals, harbour seals, seabirds, demersal fish, sharks/rays and water birds.
- 4.3.21 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 (waterfowl and waders) are also both increasing and decreasing year on year, depending on the species and location¹⁰¹. 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.
- 4.3.22 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 1986 baseline level¹⁰². The reasons for these declines are varied, with a degree of uncertainty. For example, 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,

⁹⁹ Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

¹⁰⁰ 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)

¹⁰¹ 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.

¹⁰² 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).

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 decline¹⁰³. Some species trends, although lower, appear to be stabilising possibly at a new level which differs from the 1986 baseline.

- 4.3.23 This assessment found that seabird breeding productivity between 1986 and 2016 varied for the 12 species analysed¹⁰⁴. 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.
- 4.3.24 When considering trends in the wider environmental baseline, 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^{105,106}. 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 2000¹⁰⁷. However, it is noted that bycatch of harbour seals has been reported in the static net fishery in recent years¹⁰⁸.
- 4.3.25 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.
- 4.3.26 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 MSY¹⁰⁹.

¹⁰³ 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.

¹⁰⁴ 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).

¹⁰⁵ Marine Scotland (2011) Scotland's Marine Atlas: Information for The National Marine Plan.

¹⁰⁶ 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.

¹⁰⁷ 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)

¹⁰⁸ 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.

¹⁰⁹ ICES Stock Assessment Graphs (2018) [online] Available at: <http://standardgraphs.ices.dk/stockList.aspx> (accessed 22/01/2018)

4.3.27 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 pressures¹¹⁰.

Box 1 Pressures on marine biodiversity, flora and fauna

Commercial fishing:

- Removal of target fish species
- Bycatch of both non-target fish and other species,
- Abrasion of the seabed and its benthic habitat 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 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
- 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;
- 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.

¹¹⁰ The Scottish Government (2013) FEAST – Feature Activity Sensitivity Tool. [online] Available at: <http://www.marine.scotland.gov.uk/feast/> (accessed 02/05/18)

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;
- Elevated concentrations of contaminants used in sea lice treatment, fish health and anti-fouling;
- 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;
- May affect wild salmon through transmission of sea lice; and
- May disturb marine animals, including through increased noise levels associated with Acoustic Deterrent Device (ADD) operations at finfish aquaculture sites.

Marine wildlife watching:

- May result in increased disturbance and displacement to populations of marine animals such as whales, dolphins and bird species; and
- May give rise to collision risk of mobile species with vessels (e.g. birds, mammals etc.).

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;
- May disturb marine animals if the Scottish Marine Wildlife Watching Code is not adhered to through human and/or vessel presence; and
- May give rise to collision risk of mobile species with vessels (e.g. birds, mammals etc.).

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
- Could result in changes to sediment transport through changes in energy levels in the water; and
- May disturb marine animals, particularly through increased noise levels associated with construction activities (e.g. percussive piling) and survey activities.

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.

Survey Activities

- May disturb marine animals, through increased noise levels in the marine environment associated with the use of acoustic survey equipment; and
- May give rise to collision risk of mobile species with vessels (e.g. birds, mammals etc.).

Coastal Development

May disturb marine animals, through increased noise levels in the marine environment associated with construction activities.

4.4 Geodiversity

4.4.1 This section discusses the Geodiversity baseline, of relevance to the ‘Soil’ SEA topic.

Seafloor geodiversity

4.4.2 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.

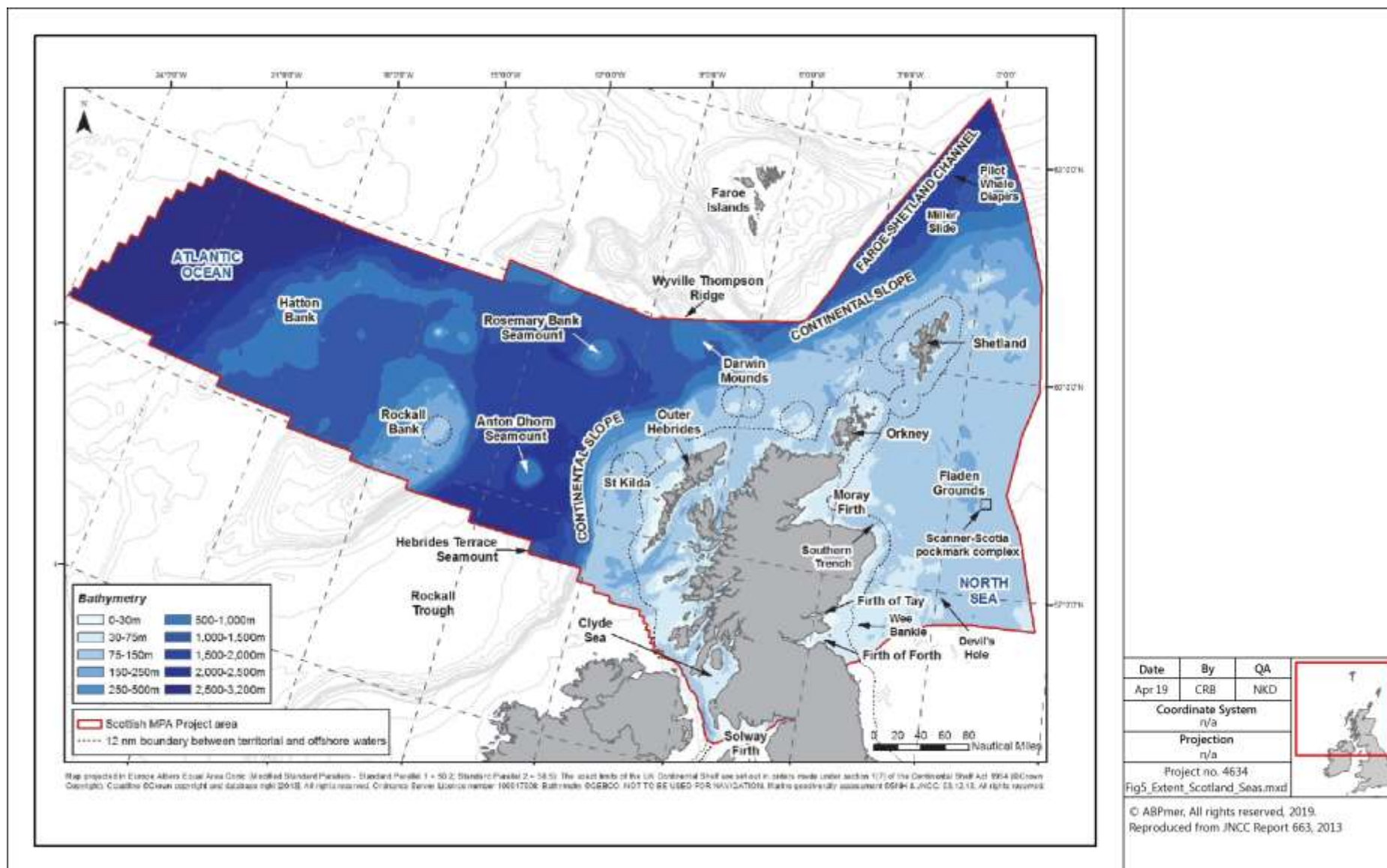
4.4.3 There are six protected features of Scottish geodiversity:

- 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.

4.4.4 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



- 4.4.5 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.
- 4.4.6 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 4.3.2 to 4.3.3.
- 4.4.7 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 high¹¹¹ (Figure 6).

Coastal geodiversity

- 4.4.8 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

- 4.4.9 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 and diversity. Intervention at one point on a coastline can have a negative knock-on effect at another point in this dynamic landscape.
- 4.4.10 Pressures on geodiversity features in Scottish seas arise from multiple activities, including renewable energy scheme development, seafloor exploration activities and fishing¹¹².

¹¹¹ Taken from Marine Scotland (2008) Scotland's Seas: Towards Understanding their State, Chapter 2.

¹¹² 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

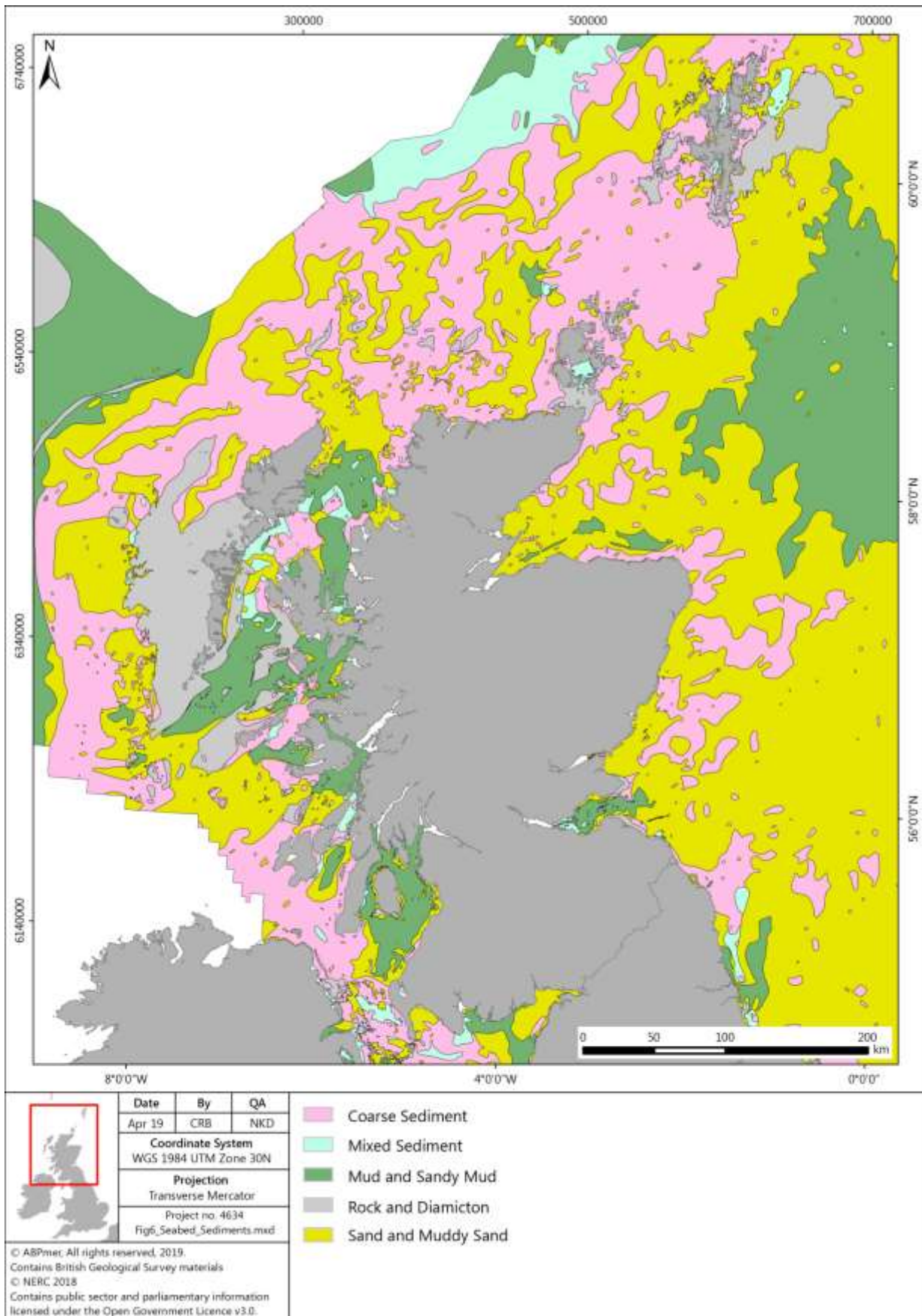
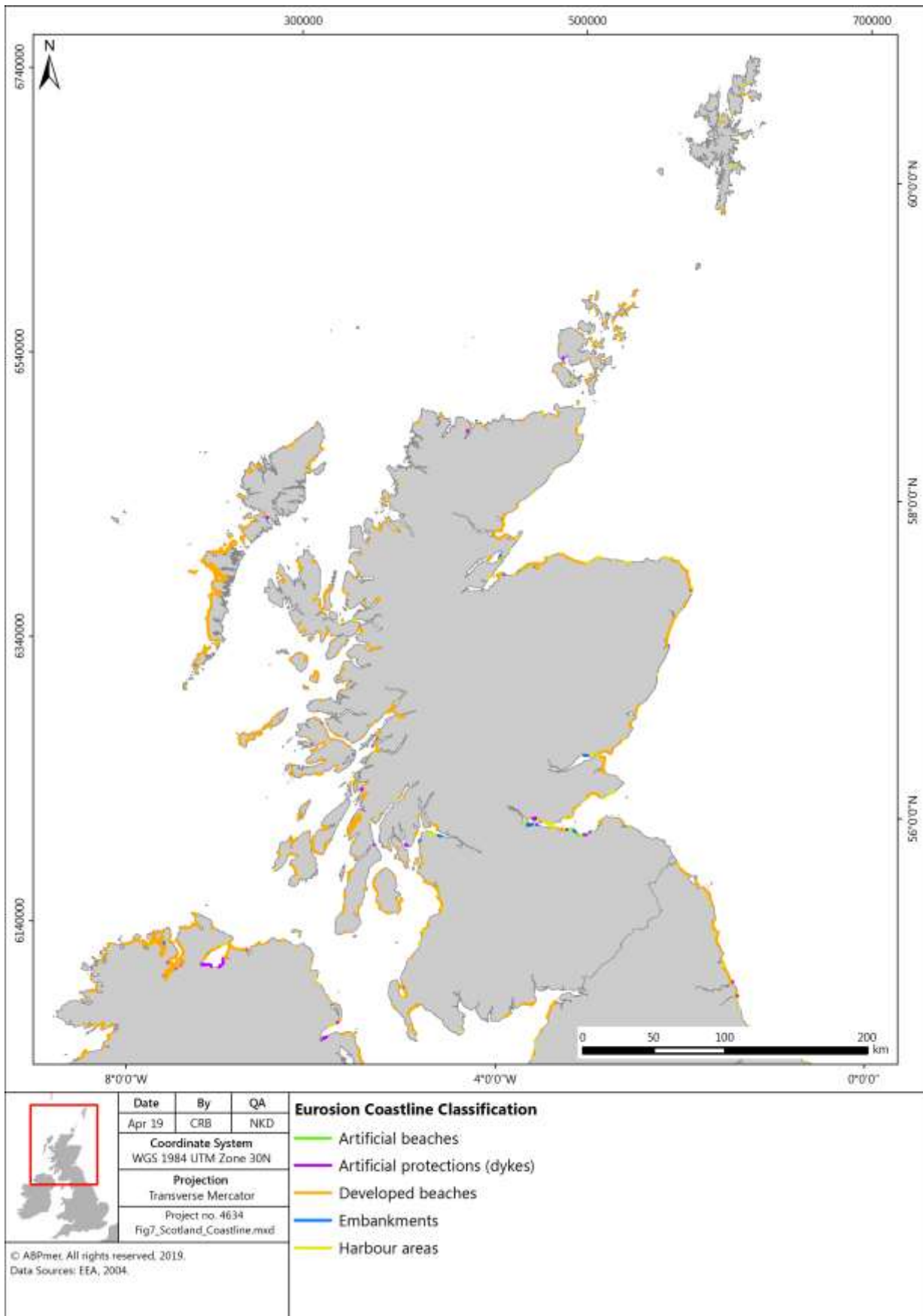


Figure 7 Scotland's coastline



4.5 Ecological status of water bodies

4.5.1 This section discusses the Ecological status of water bodies baseline, of relevance to the 'Water' SEA topic.

4.5.2 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 – 2021); 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.
- In offshore waters in Europe the protection of water bodies is driven by the objectives of the Marine Strategy Framework Directive (MSFD), which aims to protect more effectively the marine environment across Europe. The MSFD was adopted in 2008 and requires all member states to develop a strategy for its marine waters in order to progress towards achieving Good Environmental Status of the marine environment by 2020.

4.5.3 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 physico-chemical 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).

4.5.4 For good status, the chemical, physico-chemical 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.

- 4.5.5 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 2017 (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 87% of estuaries in good or better condition (12 high, 30 good, and 6 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).
- 4.5.6 There are 86 designated bathing areas in Scotland, of which 28 were classified as excellent (32.6%), 34 were classified as good (39.5%), 13 were classified as sufficient (15.1%) and 11 are classified as poor (12.8%) for the 2018/2019 season¹¹³. There are 85 Shellfish Water Protected Areas in Scotland¹¹⁴. Classification of shellfish harvesting areas, specifically within Production areas for bivalve molluscs, is monitored and reported annually by Food Standards Scotland¹¹⁵.
- 4.5.7 The offshore pSPAs overlap with the MSFD North-East Atlantic Ocean marine region (Celtic Seas). Achieving Good Environmental Status under the MSFD involves satisfying several qualitative descriptors relating to biodiversity and ensuring the sustainable use of the marine environment, for example Descriptor 1 (D1) for biological diversity, D6 for seafloor integrity and D8 for contaminant effects.
- 4.5.8 Under the MSFD progress is monitored against the qualitative descriptors at a regional level. The OSPAR intermediate assessment¹¹⁶ identified in 2017 that progress has been made against a number of descriptors, particularly regarding recovery of the population abundance of sensitive fish species in the Celtic Seas.

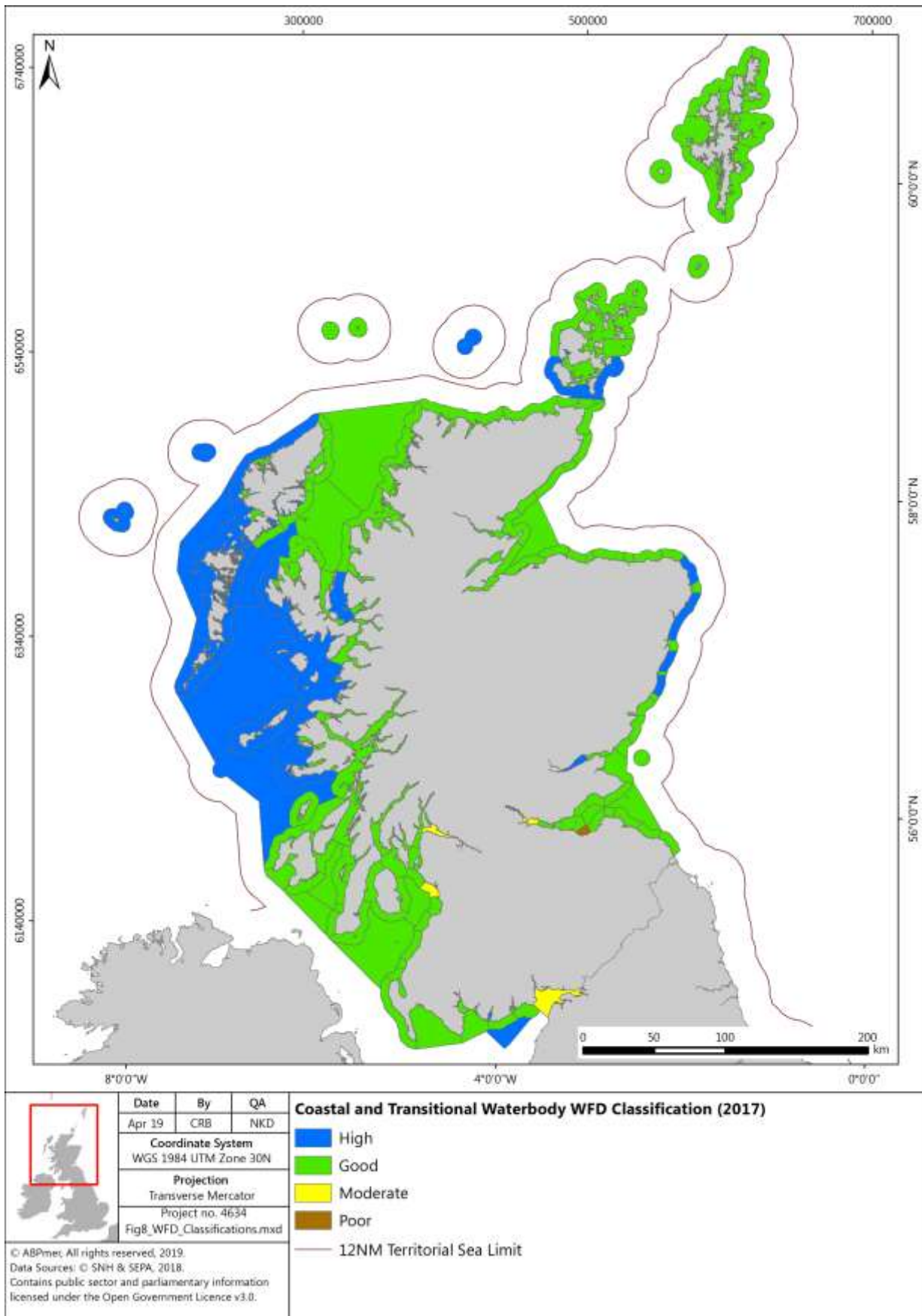
¹¹³ <https://apps.sepa.org.uk/bathingwaters/Classifications.aspx> (assessed 28/03/2019).

¹¹⁴ <https://www.sepa.org.uk/environment/water/monitoring/protected-areas/#Shellfish> (accessed 28/03/2019).

¹¹⁵ <https://www.foodstandards.gov.scot/business-and-industry/industry-specific-advice/shellfish> accessed 28/03/2019).

¹¹⁶ OSPAR (2017) Intermediate Assessment 2017, available at <https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/>

Figure 8 Coastal waters WFD classification in 2016



Trends and pressures

- 4.5.9 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 generation¹¹⁷. 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 animals¹¹⁸.
- 4.5.10 Where coastal and transitional water bodies within Scotland are identified as moderate or poor, this classification is due to the ecological parameter 'morphology' not achieving good status in most instances¹¹⁹. These water bodies are located within the Firth of Forth, the Firth of Clyde and Solway Firth.
- 4.5.11 Potential pressures on the MSFD that are applicable include increases in fishing activity, aquaculture, marine renewables, increases in oil and gas activity (and associated chemical discharges), increases in seabed extractive activities (i.e. seabed mining).

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

- 4.6.1 The term 'carbon cycle' refers to the circulation of carbon in the environment, in the context of this report it 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, bacterial decomposition of organic matter or respiratory processes within the food chain may release the stored carbon back into the environment.
- 4.6.2 Over half of global carbon sequestration occurs through fixation during oceanic photosynthesis and long-term storage of the produced organic material¹²⁰. In

¹¹⁷ 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).

¹¹⁸ 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).

¹¹⁹ SEPA. 2018. SEPA Water Classification Hub. Available at <https://www.sepa.org.uk/data-visualisation/water-classification-hub/> (accessed 28/03/2019).

¹²⁰ Azam F. and Jiao N. (2011). Preface: Revisiting the Ocean's Carbon Cycle. In: Microbial Carbon Pump in the Ocean. Science/AAAS Business Office. Supplement to Science. Available at: https://www.sciencemag.org/site/products/scor_aaas.pdf (accessed 28/03/2019).

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

4.6.3 Within the marine environment, habitats and processes capable of carbon fixation and sequestration are defined as ‘blue carbon sinks’. 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 are¹²¹:

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

4.6.4 The largest contribution to carbon fixation and sequestration in Scottish waters comes from phytoplankton, via photosynthesis and subsequent deposition of the produced organic matter in seabed sediments. This may occur either directly through the export of phytoplankton or indirectly through the consumption of phytoplankton by other organisms and subsequent export of this organic matter through the food chain¹²².

4.6.5 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. Therefore, the potential for shallow shelf sediments to provide a long-term carbon storage is a function of sedimentation rates and the degree of recycling of organic carbon. The rate of recycling of

¹²¹ 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.

¹²² Kröger, S., Parker, R., Cripps, G. and Williamson, P. (2018). Shelf Seas: The Engine of Productivity, Policy Report on NERC-Defra Shelf Sea Biogeochemistry programme. Cefas, Lowestoft. DOI: 10.14465/2018.ssb18.pbd. Available at: https://www.uk-ssb.org/shelf_seas_report.html (accessed 28/03/2019).

organic carbon is driven by the level of oxygen available for bacterial and chemical breakdown of organic matter¹²³, which is primarily influenced by disturbance of seabed sediments and the oxygen content of the seawater above the seabed.

- 4.6.6 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. However, the fate of carbon within kelp (i.e. whether it is eventually sequestered permanently) is not quantified, and the majority of stored carbon in kelp is understood to be recycled rather than sequestered¹²⁴.
- 4.6.7 Several of the other habitats listed, including maerl beds, are more efficient at carbon fixation and sequester a larger proportion of carbon as compared to their physical extent, but as their total extent across Scotland is low, they do not affect the whole of the Scottish estimate.

Trends and pressures

- 4.6.8 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. Resuspension events increase the opportunity for organisms to recycle any biologically available carbon from the sediment, reducing sequestration in the sediment once it re-settles on the seabed.
- 4.6.9 Such storm events are also likely to increase the turbidity of the water, through increased sediment resuspension, which could potentially reduce available light for photosynthesis, reducing growth rates and therefore reducing the overall carbon sequestration capacity of marine habitats.
- 4.6.10 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

¹²³ Kröger, S., Parker, R., Cripps, G. and Williamson, P. (2018). Shelf Seas: The Engine of Productivity, Policy Report on NERC-Defra Shelf Sea Biogeochemistry programme. Cefas, Lowestoft. DOI: 10.14465/2018.ssb18.pbd. Available at: https://www.uk-ssb.org/shelf_seas_report.html (accessed 28/03/2019).

¹²⁴ *ibid.*

the potential to affect how Scotland's marine environments regulate atmospheric carbon levels.

- 4.6.11 Shelf seas around the UK are predicted to be 1.5°C to 4°C warmer by the end of the 21st century¹²⁵. 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 life¹²⁶.
- 4.6.12 An increase in atmospheric carbon dioxide will lead to a subsequent increase in dissolved CO₂ concentrations within the ocean, increasing ocean acidity. This has the potential to hinder calcium carbonate producing organisms, therefore reducing their ability to sequester carbon in the long term. In addition, following mortality of such organisms, there is increased potential for carbonate shells or skeletons to dissolve faster and therefore recycle greater amounts of carbon before they can be sequestered in seabed sediments.

4.7 Future trends in marine industry

- 4.7.1 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.
- 4.7.2 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; alongside port and harbour developments which are likely to continue.

Aquaculture

- 4.7.3 Under the Aquaculture Growth Strategy¹²⁷ the industry aims, supported by the Scottish Government¹²⁸, to double the economic contribution of the sector by 2030.
- 4.7.4 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.
- 4.7.5 The development of additional aquaculture sites has the potential to introduce or increase pressure on the receptors identified above, as described in Box 1.

¹²⁵ 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)

¹²⁶ Hiscock, K., Southward, A., Tittley, I. and Hawkins, S. (2001). The impact of climate change on subtidal and intertidal benthic species in Scotland. Report to Scottish Natural Heritage from the Marine Biological Association of the UK.

¹²⁷ 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)

¹²⁸ Scottish Government Aquaculture Website, [online] Available at <https://www.gov.scot/Topics/marine/Fish-Shellfish> (accessed 30/07/2018)

Renewable energy

- 4.7.6 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.
- 4.7.7 As a result, a number of projects have already been consented for development within coastal waters, and the draft plans for wind¹²⁹, wave¹³⁰ and tidal¹³¹ energy development identify future 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>.
- 4.7.8 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.
- 4.7.9 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.

Ports and Harbours

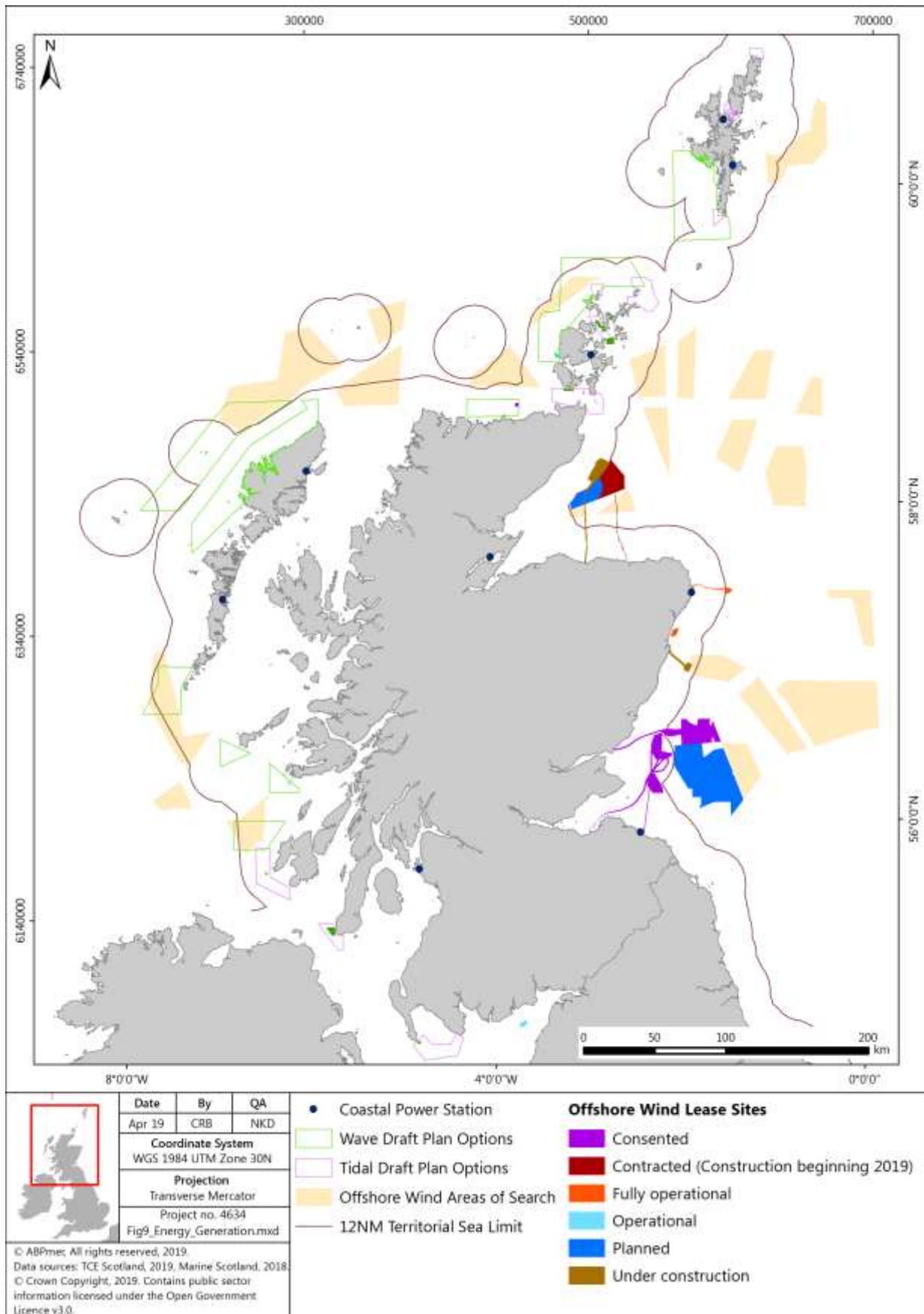
- 4.7.10 There are numerous ports and harbours located around Scottish coastlines. There is potential for port or harbour development projects, or dredging projects to be undertaken in the future. The volume or trend in the number of projects is uncertain, however future projects in the marine environment will be managed through the marine licencing process.

¹²⁹ Scottish Government; Sectoral Marine Plan for Offshore Wind Energy (encompassing Deep Water Plan Options) – Context Report, June 2018, ISBN 9781788519595.

¹³⁰ Scottish Government, Wave Energy in Scottish Waters, Initial Plan Framework, May 2013.

¹³¹ Scottish Government, Tidal Energy in Scottish Waters, Initial Plan Framework, May 2013.

Figure 9 Current, planned and potential future offshore energy generation around Scottish coasts



5 Results of SEA

5.1 Updates to the 2018 Environmental Report

- 5.1.1 The results of the SEA have been updated to reflect the changes to the preferred policy recommendation and the new, expanded set of reasonable alternatives developed by Marine Scotland.

5.2 Introduction

- 5.2.1 The purpose of this section is to report the results of the updated SEA.
- 5.2.2 The classification of the pSPAs places duties on Competent Authorities under the Habitats Regulations¹³² to assess plans and projects likely to have a significant effect on a Natura Site, including SPAs, and to prevent any adverse effects from occurring¹³³. There are specific obligations for authorities to consider when making decisions to permit plans and projects which in practice influences the types of activities and development that could eventually be permitted. Furthermore, there are special provisions which ensure that marine SPAs are adequately protected and managed¹³⁴. As such, it is considered that the classification process alone, irrespective of whether or not any corresponding management measures are introduced, has the potential to lead to significant beneficial environmental effects.
- 5.2.3 An overview of the implications of the preferred policy recommendation to classify 13 pSPAs on the environment, namely the Biodiversity, Flora and Fauna headline topic and component topics (see Section 3.2) and SEA objectives (Section 3.3), is provided in this section.
- 5.2.4 Any specific management measures that are subsequently required to meet the conservation objectives of the pSPAs could exacerbate or introduce additional environmental effects. Consideration has therefore also been given in this section to the generic potential impacts that could arise from the implementation of the recommended options for potentially managing the pSPAs (see Section 2.4). These recommended management options do not necessarily reflect any management measures that may eventually be adopted by the Scottish Government for individual sites. Any specific management measures will themselves be subject to further consideration under the 2005 Act.

¹³² 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.

¹³³ 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)

¹³⁴ 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)

5.2.5 In fulfilment of the 2005 Act, this section also considers the likely significant effects on the environment of the four SEA Reasonable Alternatives and the option to classify either 2 SPAs or 1 SPA in Orkney waters (Section 3.5), as well as any requirements for mitigation and monitoring. In addition, the potential cumulative effects of the preferred policy recommendation alone and in combination with other plans and programmes are identified and reviewed.

5.3 Environmental effects

5.3.1 Habitats Regulations Appraisals (HRAs) and Environmental Impact Assessments (EIAs) 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). In terms of the preferred policy recommendation, this is likely to principally apply to licensed activities associated with the aquaculture, marine renewables and ports and harbour sectors as these (particularly the former two sectors) have aspirations to expand in Scottish waters in the foreseeable future (Section 4.6).

5.3.2 The preferred policy recommendation to classify 13 pSPAs will provide a statutory requirement on developers to assess all plans and projects with the potential to have negative impacts on qualifying features under the HRA process. Classification will also inform developers with a better understanding of the bird species that are present and hence need to be protected. This greater clarity and confidence will support developers to undertake more effective HRAs and EIAs for future developments. This in turn may reduce pressures associated with regulated activities that have the potential to affect the qualifying features of the pSPAs. This is particularly the case for pSPAs with qualifying features that are not currently protected (e.g. overwintering birds). There may also be environmental benefits for foraging seabird qualifying features of pSPAs, where these bird colonies are already protected by existing SPAs.

5.3.3 Alternatively, following review by competent authorities, developers may look to avoid progressing consented developments that have not been built and re-locating regulated activities away from pSPAs as they will 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.

5.3.4 Overall, the increased protection that will result from the preferred policy recommendation to classify 13 pSPAs will provide environmental benefits for the overarching topic Biodiversity, flora and fauna, and contribute to the achievement of the SEA objectives (Table 8).

Table 8 Impact on SEA objectives

SEA objective	Objective met Y/N	Rationale
1. To safeguard marine and coastal ecosystems, including species and habitats, and their interactions	Yes	Protection of bird populations, feeding grounds and prey species could contribute to the achievement of this objective by minimising or avoiding the disturbance and/or damage of marine species and habitats.
2. To avoid pollution of the coastal and marine water environment	Yes	Protection of feeding grounds and prey species 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.
3. To maintain and protect the character and integrity of the seabed including avoidance of pollution of the seabed strata/seabed sediments	Yes	Protection of feeding grounds and prey species 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.
4. To maintain or work towards achieving good ecological status	Yes	Protection of feeding grounds and prey species could contribute to the 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.
5. 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.

5.3.5 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.

5.3.6 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 allow for population growth and therefore result in the potential spillover of species (including both designated and non-designated species) from protected areas

into unprotected areas if there is a population surplus and the carrying capacity of the protected area is surpassed^{135,136}.

- 5.3.7 The implementation of some or all of the recommended options for management (Table 2) 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 constrained by management measures. 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 lead to greater use of some static gears, introducing different impacts on the environment. 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.
- 5.3.8 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. It has therefore not been possible to assess the significance of any changes to future activities.

5.4 Reasonable alternatives

5.4.1 The 2005 Act requires that the likely significant effects on the environment of any reasonable alternatives to the preferred policy recommendation are identified, described and evaluated, taking into account the objectives and geographical scope of the plan or programme. Following the comments made by respondents to the Environmental Report that was published for consultation in 2018¹³⁷, Marine Scotland has developed a revised and expanded set of reasonable alternatives that are described in more detail in Section 3.5. In summary these are:

- **SEA Reasonable Alternative 1** - classify all pSPAs with all species that regularly occur in qualifying numbers and at the same time identify additional conservation measures, including PMF status for some species to further enhance conservation benefits for species;
- **SEA Reasonable Alternative 2** - classify all pSPAs with all species that regularly occur in qualifying numbers;
- **SEA Reasonable Alternative 3** – classify all pSPAs, removing the qualifying status of specified migratory species from relevant pSPAs and

¹³⁵ 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.

¹³⁶ 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.

¹³⁷ Scottish Government (2018). Consultation on the Strategic Environmental Assessment for 15 proposed Special Protection Areas. Available at: <https://consult.gov.scot/marine-scotland/sea-for-15-proposed-special-protection-areas/> (accessed 13/03/2019).

removing the qualifying status of breeding red-throated diver from neighbouring marine pSPAs; and

- **SEA Reasonable Alternative 4** - classify all pSPAs, removing the qualifying status of specified migratory species from relevant pSPAs, removing the qualifying status of breeding red-throated diver from neighbouring marine pSPAs and reducing replication in the Scottish network for species already well represented in the existing UK marine SPA network and where the majority of their population is not in Scotland.

5.4.2 Marine Scotland is also considering classifying either one or two SPAs in Orkney Waters:

- Option 1: Classify Orkney Inshore Waters pSPA; and
- Option 2: Classify North Orkney pSPA and Scapa Flow pSPA.

5.4.3 The potential environmental effects associated with the four new Reasonable Alternatives and both Options 1 and 2 have been identified and are set out in detail in Table 9 and summarised below.

Reasonable Alternative 1

5.4.4 The increased protection afforded by SEA Reasonable Alternative 1 compared to the preferred policy recommendation has the potential to provide additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objectives at each of the pSPAs, including both options to classify one or two pSPAs in Orkney waters (Options 1 and 2).

Reasonable Alternative 2

5.4.5 At East Mainland Coast, Shetland pSPA and North Orkney pSPA (Option 2), SEA Reasonable Alternative 2 offers protection to a higher number of bird species and/or a greater spatial extent of environmental protection which in turn has the potential to provide additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objectives compared to the preferred policy recommendation. At the remaining sites, SEA Reasonable Alternative 2 provides the same level of protection as the preferred policy recommendation and therefore no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objectives.

Reasonable Alternatives 3 and 4

5.4.6 SEA Reasonable Alternatives 3 and 4 will result in Bluemull and Colgrave Sounds pSPA not being classified. Compared to the preferred policy recommendation this would result in no protection being afforded to this site and therefore the potential for adverse effects on the overarching topic Biodiversity, Flora and Fauna as well no contribution to the achievement of SEA Objectives.

At North Orkney pSPA (Option 2), SEA Reasonable Alternatives 3 and 4 offer protection to a reduced number of bird species compared to the preferred policy recommendation. There is therefore the potential for adverse effects on the overarching topic Biodiversity, Flora and Fauna as well no contribution to the achievement of SEA Objectives. This is also the case under SEA Reasonable Alternative 4 at Moray Firth and Solway Firth. At the remaining sites, SEA Reasonable Alternatives 3 and 4 provide the same levels of protection as the preferred policy recommendation and therefore no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objectives.

Table 9 Assessment of SEA Reasonable Alternatives

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
Bluemull & Colgrave Sounds	No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	Removal of a single qualifying feature (red-throated diver) would result in this site not being taken forward for classification. Compared to the preferred policy recommendation, there would be reduced protection afforded to red-throated diver both in terms of protecting important foraging areas and in supporting terrestrial populations. There is therefore a potential for adverse effects on the overarching topic Biodiversity, Flora and Fauna as well no contribution to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	Same as SEA Reasonable Alternative 3.
East Mainland Coast, Shetland	Higher number of qualifying features compared to the preferred policy recommendation which will result in protection also	Higher number of qualifying features compared to the preferred policy recommendation which will result in protection also	No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the	Same as SEA Reasonable Alternative 3.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	<p>being afforded to long-tailed duck and red-breasted merganser. A small change in the boundary of the site compared to the preferred policy recommendation to reflect the distribution of the additional qualifying features will provide a greater spatial extent of environmental protection. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of all the SEA Objectives.</p>	<p>being afforded to long-tailed duck and red-breasted merganser. A small change in the boundary of the site compared to the preferred policy recommendation to reflect the distribution of the additional qualifying features will provide a greater spatial extent of environmental protection. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of all the SEA Objectives.</p>	<p>same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>	
Seas off Foula	<p>No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred</p>	<p>No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for</p>	<p>Same as SEA Reasonable Alternative 2.</p>	<p>Same as SEA Reasonable Alternative 2.</p>

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	<p>policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>	<p>the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>		
Orkney Inshore Waters (Option 1)	<p>No variation in the qualifying features compared to the preferred policy recommendation should the option to classify one SPA in Orkney be taken forward (Option 1). Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation under Option 1. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and</p>	<p>No variation in the qualifying features compared to the preferred policy recommendation should the option to classify one SPA in Orkney be taken forward (Option 1). This would therefore offer the same level of protection as the preferred policy recommendation under Option 1 and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy</p>	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation under Option 1 and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	recommendation under Option 1 and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.		
North Orkney (Option 2)	Higher number of qualifying features compared to the preferred policy recommendation should the option to classify two SPAs in Orkney be taken forward (Option 2) which will result in protection also being afforded to common eider, long-tailed duck, red-breasted merganser and European shag. In addition, conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation under Option 2. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute	Higher number of qualifying features compared to the preferred policy recommendation should the option to classify two SPAs in Orkney be taken forward (Option 2) which will result in protection also being afforded to common eider, long-tailed duck, red-breasted merganser and European shag. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation under Option 2 and therefore there will be no change in the	Lower number of qualifying features compared to the preferred policy recommendation should the option to classify two SPAs in Orkney be taken forward (Option 2). This will result in reduced protection being afforded specifically to red-throated diver at this site both in terms of protecting important foraging areas and in supporting terrestrial populations. Compared to the preferred policy recommendation under Option 2, the reduced protection will result in the potential for adverse effects on the overarching topic Biodiversity, Flora and Fauna as well a reduced contribution to the achievement of SEA Objective 1. The boundary of the site will remain the	Same as SEA Reasonable Alternative 3.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation under Option 2 and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	potential contribution to SEA Objectives 2 to 5.	same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	
Scapa Flow (Option 2)	No variation in the qualifying features compared to the preferred policy recommendation should the option to classify two SPAs in Orkney be taken forward (Option 2). Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation under Option 2. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation under Option 2 and therefore there	No variation in the qualifying features compared to the preferred policy recommendation should the option to classify two SPAs in Orkney be taken forward (Option 2). This would therefore offer the same level of protection as the preferred policy recommendation under Option 2 and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation under Option 2 and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	will be no change in the potential contribution to SEA Objectives 2 to 5.			
Moray Firth	No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	Same as SEA Reasonable Alternative 2.	Lower number of qualifying features compared to the preferred policy recommendation. This will result in no protection being afforded specifically to red-throated diver at this site both in terms of protecting important foraging areas and in supporting terrestrial populations. Compared to the preferred policy recommendation, the reduced protection will result in the potential for adverse effects on the overarching topic Biodiversity, Flora and Fauna as well a reduced contribution to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.
Ythan Estuary, Sands of Forvie and Meikle Loch	No variation in the qualifying features compared to the preferred policy	No variation in the qualifying features compared to the preferred policy	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	<p>recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation under Option 2 and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>	<p>recommendation. This would therefore offer the same level of protection as the preferred policy recommendation under Option 2 and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation under Option 2 and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>		
Outer Firth of Forth and St Andrews Bay Complex	<p>No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential</p>	<p>No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement</p>	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.		
Solway Firth	No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no	No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	Same as SEA Reasonable Alternative 2.	Lower number of qualifying features compared to the preferred policy recommendation. This will result in no protection being afforded specifically to common scoter and black-headed gull at this site both in terms of protecting important foraging areas and in supporting terrestrial populations. Compared to the preferred policy recommendation, the reduced protection will result in the potential for adverse effects on the overarching topic Biodiversity, Flora and Fauna as well a reduced contribution to the achievement of SEA Objective 1. The boundary of the site will remain the

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	change in the potential contribution to SEA Objectives 2 to 5.			same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.
Sound of Gigha	No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.
Coll & Tiree	No variation in the qualifying features compared to the preferred policy	No variation in the qualifying features compared to the preferred policy	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	<p>recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>	<p>recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>		
Rum	<p>No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential</p>	<p>No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement</p>	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	<p>additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>	<p>of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>		
West Coast of Outer Hebrides	<p>No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no</p>	<p>No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.</p>	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.

Proposed SPA	SEA Reasonable Alternative 1	SEA Reasonable Alternative 2	SEA Reasonable Alternative 3	SEA Reasonable Alternative 4
	change in the potential contribution to SEA Objectives 2 to 5.			
Seas off St Kilda	No variation in the qualifying features compared to the preferred policy recommendation. Additional conservation measures, including PMF status to certain bird species could further enhance conservation benefits compared to preferred policy recommendation. The increased protection will provide potential additional environmental benefits to the overarching topic Biodiversity, Flora and Fauna and further contribute to the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	No variation in the qualifying features compared to the preferred policy recommendation. This would therefore offer the same level of protection as the preferred policy recommendation and no change in the potential environmental benefits for the overarching topic Biodiversity, Flora and Fauna or the achievement of SEA Objective 1. The boundary of the site will remain the same as the preferred policy recommendation and therefore there will be no change in the potential contribution to SEA Objectives 2 to 5.	Same as SEA Reasonable Alternative 2.	Same as SEA Reasonable Alternative 2.

5.5 Mitigation and monitoring

- 5.5.1 No significant adverse effects have been identified by the SEA and therefore there are no mitigation measures proposed in that regard. It is acknowledged that monitoring of the SPA network is a requirement. SNH and JNCC, as statutory advisors to government, lead on the development of advice in relation to monitoring requirements.
- 5.5.2 The manner in which the sites are managed in the future may result in potential adverse effects on the environment as a result of the displacement of activities (see Section 5.2). However, at this stage the range and scale of management measures that might be implemented are not currently known and therefore it is not possible to assess the magnitude or significance of these potential adverse effects with any level of certainty.
- 5.5.3 Any specific management measures that are subsequently developed at each pSPA will be subject to further consideration under the 2005 Act and are likely to require a separate SEA. At that point, should any significant adverse effects from displacement of activities be identified then appropriate mitigation measures and monitoring proposals will be considered to ensure adverse effects are identified and managed. The potential enhancement of beneficial effects resulting from any future management measures will also be considered.

5.6 Cumulative effects

- 5.6.1 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.
- 5.6.2 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 connectivity between protected areas for these features^{138,139,140}. The potential cumulative benefits of improving 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

¹³⁸ 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.

¹³⁹ Crooks KR, Sanjayan M (2006) Connectivity Conservation. Cambridge, UK: Cambridge University Press. 726 p.

¹⁴⁰ 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.

habitats across protected sites through the larval dispersal of benthic species that form these habitats^{141,142}.

- 5.6.3 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.
- 5.6.4 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.
- 5.6.5 A separate SEA of the management measures for PMFs has been screened and scoped¹⁴³ but has yet to be fully consulted upon. 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.

¹⁴¹ 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

¹⁴² 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.

¹⁴³ <https://consult.gov.scot/marine-scotland/priority-marine-features/>

6 Conclusion

- 6.1.1 Overall, this assessment considers that the increased protection that will result from the initial 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. Classification of the sites will provide a statutory requirement to assess the impacts of plans and projects which have the potential to negatively impact pSPA features. The classification will further support developers to undertake more effective HRAs and EIAs that consider appropriate mitigation where necessary and therefore potentially reduce pressures associated with the regulated activity under assessment. Alternatively, in some cases, developers may look to site their projects some distance from the pSPAs to avoid undertaking further assessment and mitigation. This in turn would result in reduced harmful activities and potential environmental benefits within the pSPAs.
- 6.1.2 The manner in which the sites are managed in the future to ensure that the conservation objectives are achieved also has the potential to result in significant environmental effects. 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 to both designated and non-designated features within the pSPA. 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, however, 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.
- 6.1.3 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 effects 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.
- 6.1.4 The 2005 Act requires that the likely significant effects on the environment of any reasonable alternatives to the preferred policy recommendation are identified, described and evaluated. Following comments made by respondents to the 2018 Environmental Report¹⁴⁴, Marine Scotland developed a revised and expanded set of reasonable alternatives, incorporated into this updated Environmental Report. Where the SEA Reasonable Alternatives offer increased protection, either through additional conservation measures, a higher number of qualifying features and/or a greater spatial extent and/or a greater spatial extent, these

¹⁴⁴ Scottish Government (2018). Consultation on the Strategic Environmental Assessment for 15 proposed Special Protection Areas. Available at: <https://consult.gov.scot/marine-scotland/sea-for-15-proposed-special-protection-areas/> (accessed 13/03/2019).

have the potential to provide additional environmental benefits compared to the preferred policy recommendation. Where the SEA Reasonable Alternatives provide the same level of protection as the preferred policy recommendation, there would be no change in the potential environmental benefits. Where the SEA Reasonable Alternatives result in the site not being classified or a reduced number of qualifying features being protected compared to the preferred policy recommendation, this would result in the potential for adverse environmental effects.

- 6.1.5 The potential cumulative effects of the preferred policy recommendation alone and in-combination with other plans and programmes have been identified and reviewed. There will be beneficial cumulative effects from the classification and management of 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 birds that move between SPAs as the pSPAs have the potential to improve the potential connectivity between protected areas for these features. 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. Activities currently occurring in the pSPAs may 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.

7 Next Steps

7.1.1 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.

7.1.2 Scottish Government are seeking views on the following questions:

1. With respect to the SEA process, do you have any comments on the updated ER?
2. Do you have any comments on the SEA Reasonable Alternatives?
3. With respect to the classification of SPAs, do you agree with the preferred policy recommendation, and if not why not?
4. Do you prefer the option to classify Orkney Inshore Waters pSPA or the alternative option to classify North Orkney pSPA and Scapa Flow pSPA? What are the reasons for your preference?

7.1.3 Please respond to the consultation online at:

- www.scotland.gov.uk/consultations

7.1.4 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-ppas-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

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

7.1.6 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. Wider Policy Context of pSPAs

The Environmental Assessment (Scotland) Act 2005 ('the 2005 Act') and the Environmental Assessment of Plans and Programmes Regulations 2004 (the '2004 Regulations') require Responsible Authorities to identify the wider 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. This includes an overview of policies relating to the SEA topics that have been scoped into the assessment: Biodiversity, Flora and Fauna; Soil (assessed under Biodiversity, Flora and Fauna); Water (assessed under Biodiversity, Flora and Fauna); and Climatic Factors (assessed under Biodiversity, Flora and Fauna)¹⁴⁵.

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 fisheries¹⁴⁶. In recent years, Scotland has also embarked on a programme of national marine planning in accordance with national and 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 pollution¹⁴⁷. Specifically, it added an annex covering the protection and conservation of marine ecosystems and biodiversity¹⁴⁸. In 2003, Recommendation 2003/3 was adopted, relating to the establishment of an ecologically coherent network of MPAs in the North-East Atlantic¹⁴⁹.

The **EU Marine Strategy Framework Directive** (2008/56/EC) obligates Member States to develop programmes of measures which aim to achieve 'Good Environmental Status' GES in the marine environment by 2020 as well as safeguarding the marine resources

¹⁴⁵ Although it is proposed that Soil, Water and Climatic Factors be scoped in under 'Biodiversity, Flora and Fauna', relevant policies relating to each are presented under their own headings for ease of reading.

¹⁴⁶ Scottish Government (2017) Marine & Fisheries [online] Available at: <http://www.gov.scot/Topics/marine> (accessed 05/03/2018)

¹⁴⁷ OSPAR Commission (2017) OSPAR Convention [online] Available at: <https://www.ospar.org/convention> (accessed 05/03/2018)

¹⁴⁸ *ibid*

¹⁴⁹ OSPAR Commission (2018) Marine Protected Areas [online] Available at: <https://www.ospar.org/work-areas/bdc/marine-protected-areas> (accessed 24/01/2018)

that underlie key economic and social activities¹⁵⁰. It allocates responsibility for the marine environment via a regional approach that makes use of the existing cooperative framework of the OSPAR Convention¹⁵¹. The Directive is implemented within the UK via a three-part **Marine Strategy**¹⁵².

European Directive 2014/89/EU establishes a framework for maritime spatial planning and serves as a common framework across EU Member States¹⁵³. 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 space¹⁵⁴. 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 strategies¹⁵⁵.

The **Marine (Scotland) Act 2010** acts as a framework to help balance competing demands on Scotland’s inshore seas (up to 12 nautical miles)¹⁵⁶. 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 system¹⁵⁷. Among its conservation objectives is a provision for the establishment of MPAs¹⁵⁸.

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), in addition to providing a framework for cooperative management of the marine environment between Scottish Ministers and UK Government¹⁵⁹.

¹⁵⁰ 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)

¹⁵¹ 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)

¹⁵² JNCC (2016) EU Marine Strategy Framework Directive [online] Available at: <http://www.gov.scot/Topics/marine/seamanagement/marineact> (accessed 05/03/2018)

¹⁵³ 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)

¹⁵⁴ European Commission (2017) Maritime spatial planning [online] Available at: https://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning_en (accessed 05/03/2018)

¹⁵⁵ Scottish Government (2015) UK Marine Policy Statement [online] Available at: <http://www.gov.scot/Topics/marine/seamanagement/international/MPS> (accessed 05/03/2018)

¹⁵⁶ Scottish Government (2017) Marine (Scotland) Act [online] Available at: <http://www.gov.scot/Topics/marine/seamanagement/marineact> (accessed 05/03/2018)

¹⁵⁷ ibid

¹⁵⁸ 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)

¹⁵⁹ ibid

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 cohesive approach to the management of both inshore and offshore waters¹⁶⁰ in accordance with EU Directive 2014/89/EU¹⁶¹ on maritime spatial planning. It seeks to promote development in a way that is compatible with the protection and enhancement of the marine environment¹⁶².

The pSPAs are in some cases extensions to terrestrial and coastal Sites of Special Scientific Interest (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**¹⁶³ and **Circular 1/2015 - The relationship between the statutory land use planning system and marine planning and licensing**¹⁶⁴. 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, 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.

At an international level, the **OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic** is an important driver in the protection and conservation of marine ecosystems and biodiversity¹⁶⁵, including the establishment of an ecologically coherent network of MPAs in the North East Atlantic¹⁶⁶. The OSPAR List

¹⁶⁰ 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)

¹⁶¹ 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)

¹⁶² 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)

¹⁶³ 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)

¹⁶⁴ 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)

¹⁶⁵ *ibid*

¹⁶⁶ OSPAR Commission (2018) Marine Protected Areas [online] Available at: <https://www.ospar.org/work-areas/bdc/marine-protected-areas> (accessed 21/11/2018)

of Threatened and/or Declining Species and Habitats¹⁶⁷ identifies species and habitats that are considered to be priorities for protection, including several bird species.

At the European level, the Natura 2000¹⁶⁸ network is the primary vehicle for meeting the aims of the **Habitats (92/43/EEC)**¹⁶⁹ and **Birds (2009/147/EC)**¹⁷⁰ Directives. Both Directives focus on the maintenance and enhancement of biodiversity, with an emphasis on protecting rare and endangered wild species and natural habitats of European significance. The Natura 2000 network comprises terrestrial and marine SPAs and SACs. Many terrestrial and marine sites are also underpinned by the SSSI designation¹⁷¹.

The **2020 Challenge for Scotland's Biodiversity**¹⁷² is Scotland's response to the international UN Aichi Targets for 2020¹⁷³ and the EU Biodiversity Strategy to 2020¹⁷⁴. The 2020 Challenge supplements the 2004 Scottish Biodiversity Strategy¹⁷⁵ and 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 environment¹⁷⁶.

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 Directives¹⁷⁷. 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.

¹⁶⁷ OSPAR Commission (2018) List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats> (accessed 05/03/2018)

¹⁶⁸ Scottish Government (2016) Natura 2000 [online] Available at: <http://www.gov.scot/Topics/Environment/Wildlife-Habitats/protectedareas/NATURA> (accessed 05/03/2018)

¹⁶⁹ European Commission (1992) The Habitats Directive [online] Available at: http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm (accessed 05/03/2018)

¹⁷⁰ European Commission (2009) The Birds Directive [online] Available at: http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm (accessed 05/03/2018)

¹⁷¹ SNH (2016) Sites of Special Scientific Interest [online] Available at: <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/national-designations/sssis/> (accessed 05/03/2018)

¹⁷² 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)

¹⁷³ Convention on Biological Diversity (2010) Aichi Biodiversity Targets [online] Available at: <https://www.cbd.int/sp/targets/default.shtml> (accessed 05/03/2018)

¹⁷⁴ 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)

¹⁷⁵ 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)

¹⁷⁶ 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)

¹⁷⁷ ibid

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 soil¹⁷⁸. 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 soil¹⁷⁹. For example, marine geology forms part of the basis for the designation of MPAs within Scottish waters¹⁸⁰. 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, SSSIs¹⁸¹ 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**¹⁸².

At the European level, the **Marine Strategy Framework Directive 2008/56/EC** includes an annex (Annex III) of 11 qualitative descriptors (criteria amended in 2017¹⁸³) to help Member States interpret what GES means in practice¹⁸⁴. 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) characteristics¹⁸⁵. It is also regarded as crucial to achieving the Strategy’s overarching aims of protecting biodiversity and ensuring the sustainable use of the marine environment¹⁸⁶.

¹⁷⁸ Scottish Government (2009) The Scottish Soil Framework [online] Available at: <http://www.gov.scot/Publications/2009/05/20145602/0> (accessed 05/03/2018)

¹⁷⁹ *ibid*

¹⁸⁰ Scottish Government (2016) Nature Conservation MPAs [online] Available at: <http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/ncmpas> (accessed 05/03/2018)

¹⁸¹ 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)

¹⁸² *ibid*

¹⁸³ 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)

¹⁸⁴ 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)

¹⁸⁵ *ibid*

¹⁸⁶ 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: http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-6/index_en.htm (accessed 05/03/2018)

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 environment¹⁸⁷.

In Scotland, Integrated Coastal Zone Management is achieved via the work of seven Local Coastal Partnerships¹⁸⁸.

Water Policy

It was 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 wetlands¹⁸⁹. 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'.

Scotland fulfils its water protection obligations under the WFD primarily through the **Water Environment and Water Services (Scotland) Act 2003**¹⁹⁰ which defines the establishment of **River Basin Management Plans (RBMPs)**¹⁹¹, and the **Water Environment (Controlled Activities) (Scotland) Regulations 2011**¹⁹².

Other relevant legislation includes the **Pollution Prevention and Control (Scotland) Regulations 2012**, which apply specifically to pollution originating from industry discharges¹⁹³.

¹⁸⁷ 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)

¹⁸⁸ Scottish Government (2014) Managing Scotland's Coastline [online] Available at: <http://www.gov.scot/Topics/marine/marine-environment/coast> (accessed 05/03/2018)

¹⁸⁹ 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)

¹⁹⁰ 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)

¹⁹¹ SEPA (2016) River Basin Management Planning [online] Available at: <http://www.sepa.org.uk/environment/water/river-basin-management-planning/> (accessed 05/03/2018)

¹⁹² 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)

¹⁹³ 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)

The **EU Floods Directive (2007/60/EC)**¹⁹⁴ is implemented at the national level through the **Flood Risk Management (Scotland) Act 2009**¹⁹⁵. 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 was 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. As such, climatic factors policy and protection objectives relevant to the assessment are presented below.

In November 2016, the United Nations Framework Convention on Climate Change (UNFCCC) **Paris Agreement** came into force¹⁹⁶. 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°C¹⁹⁷. A further long-term goal is to achieve net-zero levels of global greenhouse gas emissions by the second half of this century. The Paris Agreement also covers a range of other issues such as mitigation through reducing emissions, adaptation, and loss and damage¹⁹⁸.

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)¹⁹⁹ 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 consultation²⁰⁰. 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.

¹⁹⁴ European Commission (2007) The EU Floods Directive [online] Available at: http://ec.europa.eu/environment/water/flood_risk/ (accessed 05/03/2018)

¹⁹⁵ 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)

¹⁹⁶ UNFCCC (2016) The Paris Agreement [online] Available at: http://unfccc.int/paris_agreement/items/9485.php (accessed 05/03/2018)

¹⁹⁷ European Commission (2016) Paris Agreement [online] Available at: http://ec.europa.eu/clima/policies/international/negotiations/paris/index_en.htm (accessed 05/03/2018)

¹⁹⁸ *ibid*

¹⁹⁹ The basket of Kyoto Protocol greenhouse gases comprises carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), for which the baseline is 1990; and hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆), for which the baseline is 1995. Nitrogen trifluoride (NF₃) has subsequently been added and applies to the second commitment period of 2013-20.

²⁰⁰ Scottish Government (2017) Climate Change Bill – Consultation Paper [online] Available at: <http://www.gov.scot/Publications/2017/06/8208/0> (accessed 02/11/2017)

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’²⁰¹. **Scotland’s National Marine Plan**²⁰² 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 2009²⁰³, replacing the Climate Change Adaptation Framework²⁰⁴ and accompanying Sector Action Plans²⁰⁵. 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 carbon sequestration²⁰⁶. The role of Marine Planning and MPAs in protecting these ecosystems is also noted²⁰⁷.

²⁰¹ 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)

²⁰² Scottish Government (2015) Scotland’s National Marine Plan [online] Available at: <http://www.gov.scot/Publications/2015/03/6517> (accessed 05/03/2018)

²⁰³ 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)

²⁰⁴ 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)

²⁰⁵ 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)

²⁰⁶ 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)

²⁰⁷ 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)