Department for Business, Energy & Industrial Strategy

OFFSHORE OIL & GAS LICENSING 29TH SEAWARD ROUND

Habitats Regulations Assessment

Stage 1 – Block and Site Screenings

November 2016

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Contents

1 Introduction

1.1 Background and overview of plan

The plan/programme covering this and future seaward licensing rounds has been subject to a Strategic Environmental Assessment (OESEA3), completed in July 2016. The SEA Environmental Report includes detailed consideration of the status of the natural environment and potential effects of the range of activities which could follow licensing, including potential effects on conservation sites. The SEA Environmental Report was subject to an 8 week public consultation period following which a post-consultation report was produced. The post-consultation report summarises the comments received and provides further clarifications which has enabled the decision to adopt the plan/programme. This decision has allowed the Oil & Gas Authority (OGA) to progress with further seaward oil and gas licensing rounds. As a result, the OGA is offering 1,246 Blocks for licensing as part of a 29th Seaward Licensing Round covering underexplored frontier areas of the UK continental shelf (UKCS).

The exclusive rights to search and bore for petroleum in Great Britain, the territorial sea adjacent to the United Kingdom and on the UKCS are vested in the Crown and the *Petroleum Act 1998* (as amended) gives the OGA the power to grant licences to explore for and exploit these resources. Offshore licensing for oil and gas exploration and production commenced in 1964 and progressed through a series of Seaward Licensing Rounds. A Seaward Production Licence grants exclusive rights to the holders "to search and bore for, and get, petroleum" in the area covered by the Licence but does not constitute any form of approval for activities to take place in the Blocks, nor does it confer any exemption from other legal or regulatory requirements. Offshore activities are subject to a range of statutory permitting and consenting requirements, including, where relevant, activity specific Appropriate Assessment (AA) under Article 6(3) of the Habitats Directive (Directive 92/43/EC).

The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (as amended) (OPAR 2001) implement the requirements of Articles 6(3) and 6(4) of the Habitats Directive with respect to oil and gas activities in UK territorial waters and on the UK Continental Shelf; and for other relevant activities in offshore waters (i.e. excluding territorial waters) this is covered by the *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007* (as amended). Within territorial waters, the Habitats Directive is transposed into UK law via the *Conservation of Habitats and Species Regulations 2010* in England and Wales, the *Conservation (Natural Habitats, &c.) Regulations 1994* in Scotland (for non-reserved matters), and the *Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995* (as amended) in Northern Ireland.

1.2 Purpose

As the petroleum licensing aspects of the plan/programme are not directly connected with or necessary for nature conservation management of European (Natura 2000) sites, to comply with its obligations under the relevant regulations, the Department for Business, Energy and Industrial Strategy (BEIS, formerly the Department of Energy and Climate Change) is undertaking a Habitats Regulations Assessment (HRA)[1].

In this HRA, the Department has applied the Habitats Directive test[2] (elucidated by the European Court of Justice in the case of Waddenzee (Case C-127/02)[3]) which test is:

> *A plan or project not directly connected with or necessary to the management of a site must be subject to an AA if it cannot be excluded on the basis of objective information that it will have a significant effect on that site, either individually or in combination with other plans or projects.*
>
> *Where a plan or project not directly connected with or necessary to the management of the site is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on that site. The assessment of that risk must be made in the light, inter alia, of the characteristics and specific environmental conditions of the site concerned by such a plan or project.*

1.3 Approach to screening

This screening assessment is the first stage of the HRA to determine whether licensing of any of the Blocks offered in the 29th Round may have a significant effect on a relevant site, either individually or in combination[4] with other plans or projects. The screening assessment has been undertaken in accordance with the European Commission Guidance (EC 2000) and with reference to other guidance and reports, including the Habitats Regulations Guidance Notes (EN 1997, Defra 2012, SEERAD 2000), SNH (2015), the National Planning Policy Framework (DCLG 2012[5]) and English Nature Research report, No. 704 (Hoskin & Tyldesley 2006).

The approach taken to screening has been to identify all relevant European sites with the potential to be affected by exploration/appraisal activities that could follow licensing (i.e. those

[1] Note that while certain licensing and related regulatory functions have been passed to the OGA, environmental regulatory functions are retained by BEIS, and are administered by the Offshore Oil and Gas Environment and Decommissioning Team (OGED).
[2] See Article 6(3) of the Habitats Directive.
[3] Also see the Advocate General's Opinion in the recent 'Sweetman' case (Case C-258/11), which confirms those principles set out in the Waddenzee judgement.
[4] Note that "in-combination" and "cumulative" effects have similar meanings, but for the purposes of HRA, and in keeping with the wording of Article 6(3) of the Habitats Directive, "in-combination" is used to describe the potential for such effects throughout. More information on the definitions of "cumulative" and "in-combination" effects are available in MMO (2014) and Judd *et al.* (2015).
[5] Which states that "listed or proposed Ramsar sites", should receive the same protection as European sites

sites with marine qualifying features or with a marine ecological linkage such as anadromous and catadromous fish) (see Section 3). These sites are screened for the likelihood of significant effects based on the nature and scale of potential activities (as outlined in Section 2). Consideration is also given as appropriate to the site specific advice on operations. Those Blocks which are screened in will be subject to a second stage of HRA, Appropriate Assessment, before licensing decisions are taken.

This screening assessment report is organised as follows:

- Overview of the plan, including a list and map of the Blocks offered, summary of the licensing process and nature of the activities that could follow (see Section 2)
- Identification of all European sites potentially affected, together with their various interest features (Section 3 and Appendix A)
- Description of the screening assessment process used to identify likely significant effects on relevant European sites (Section 4)
- The screening assessment including a consideration of in-combination effects (Section 5 and Appendix B)
- Summary of conclusions including list of Blocks from which likely significant effects on relevant European sites could not be discounted at the screening stage and for which further assessment (Appropriate Assessment) is required before licensing decisions are made (Section 6)

As part of this process, BEIS has consulted with the Joint Nature Conservation Committee (JNCC), Natural England, Scottish Natural Heritage (SNH), Natural Resources Wales (NRW) and the Department of Agriculture, Environment and Rural Affairs (DAERA) on a draft of this screening assessment.

2 Blocks offered and potential activities

2.1 Blocks offered

Offshore Blocks on offer during the 29th Seaward Licensing Round which are considered in this screening assessment are listed in Table 2.1 and shown on Figure 2.1. Note that many of these Blocks have not been licensed previously. The Blocks are located in frontier areas to the west of Scotland, in the northern North Sea and in the Mid North Sea High, in which relatively less exploration has taken place than in other areas. The OGA undertook two regional seismic surveys in 2015 covering the Mid North Sea High and Rockall Basin, the results of which augment existing data and update current understanding of prospectivity to inform future licensing, in particular this 29th Seaward Licensing Round. The OGA has released almost 40,000 line kilometres of new and legacy seismic data from the Rockall Basin and Mid-North Sea High areas acquired during the 2015 seismic survey[6].

2.2 Licensing

The exclusive rights to search and bore for and get petroleum in the territorial sea adjacent to the United Kingdom and on the UK Continental Shelf (UKCS) are vested in the Crown and the *Petroleum Act 1998* (as amended) gives the OGA the power to grant licences to explore for and exploit these resources. The main type of offshore Licence is the Seaward Production Licence. Offshore licensing for oil and gas exploration and production commenced in 1964 and has progressed through a series of Seaward Licensing Rounds. A Seaward Production Licence may cover the whole or part of a specified Block or a group of Blocks. A Seaward Production Licence grants exclusive rights to the holders "to search and bore for, and get, petroleum" in the area covered by the Licence but does not constitute any form of approval for activities to take place in the Blocks, nor does it confer any exemption from other legal or regulatory requirements.

Several sub-types of Seaward Production Licence were available in previous rounds (Traditional, Frontier and Promote). These licences have now been superseded by the "Innovate" licence, within which, for the 29th Round, the clauses of previous licences[7] may still be applied but within the structure of a single licence type[8].

[6] https://www.ukoilandgasdata.com

[7] The Model Clauses that apply for Seaward Production Licences are set out in the *Petroleum Licensing (Production) (Seaward Areas) Regulations 2008*. These set out the terms and conditions that apply to such licences. (Other regulations, including environmental regulations for offshore oil and gas activities, also apply to licensees.) A number of proposed Innovate licence features require changes to Model Clauses which are yet to

As per previous licensing structures, the Innovate licence is made up of three terms covering exploration (Initial Term), appraisal and field development planning (Second Term), and development and production (Third Term). The lengths of the first two terms are flexible, but have a maximum duration of 9 and 6 years respectively. The Third Term is granted for 18 years but may be extended if production continues beyond this period. The Innovate licence introduces three Phases to the Initial Term, covering:

- Phase A: geotechnical studies and geophysical data reprocessing (note that the acquisition of new seismic could take place in this phase for the purpose of defining a 3D survey as part of Phase B, but normally this phase will not involve activities in the field)
- Phase B: shooting of new seismic and other geophysical data
- Phase C: exploration and appraisal drilling

Applicants have the flexibility to choose the Phase that they wish to initially apply for, the phase combinations they wish to undertake, and the duration of these Phases. For example all phases may be undertaken or a combination of selected phases, or in some instances where it can be demonstrated that no exploration is required (e.g. development of an existing discovery or field re-development), licence award would go straight to the Second Term. Applicants may choose to spend up to 4 years on a single Phase in the Initial Term, but cannot take more than 9 years to progress to the Second Term. A firm commitment to drill a well will normally only be considered for applicants who propose to start at Phase C (i.e. at the point where the drilling decision does not require any more analysis).

The phased approach allows for a decision to be made on whether to proceed to the next phase within the Initial Term. Whilst there is no mandatory requirement to relinquish licences at the end of Phases A and B for the 29th Round, the OGA recommend that any area not being actively worked on should be relinquished. Annual updates on work programme progress will be required, in addition to dialogue with OGA no later than three months before the end of each Phase.

Financial viability and technical capability are considered prior to licence award for applicants proposing to start at Phase A or B, but further technical and financial capacity for Phase C activities would need to be demonstrated before the licence could enter Phase C and drilling could commence. If the applicant proposes to start the licence at Phase C or go straight to the Second Term, it must demonstrate it has the technical competence to carry out the activities that would be permitted under the licence during that term, and the financial capacity to complete the Work Programme, before the licence is granted. It is noted that the safety and environmental capability (e.g. requirements of the Offshore Safety Directive) and track record of applicants is considered by the OGA through written submissions before licences are

be subject to relevant regulatory processes. These are anticipated to be in place, subject to consultation and Parliamentary process, for subsequent seaward Rounds.

[8] Refer to OGA guidance on applications for the 29th Round at: https://www.ogauthority.co.uk/licensing-consents/licensing-rounds/

awarded[9]. Where full details cannot be provided via the written submissions at the application stage, licensees must provide supplementary submissions that address any outstanding environmental and safety requirements before approvals for specific offshore activities such as drilling will be issued.

2.3 Activity

As part of the licence application process, applicants provide the OGA with details of work programmes they propose in the Initial Term. These work programmes are considered with a range of other factors in the OGA's decision on whether to license the Blocks and to whom. There are three levels of drilling commitment:

- A Firm Drilling Commitment is a commitment to the OGA to drill a well. Firm drilling commitments are preferred on the basis that, if there were no such commitment, the OGA could not be certain that potential licensees would make full use of their licences. However, the fact that a licensee has been awarded a licence on the basis of a "firm commitment" to undertake a specific activity should not be taken as meaning that the licensee will actually be able to carry out that activity. This will depend upon the outcome of all relevant activity specific environmental assessments.
- A Contingent Drilling Commitment is also a commitment to the OGA to drill a well, but it includes specific provision for the OGA to waive the commitment in light of further technical information.
- A Drill or Drop (D/D) Drilling Commitment is a conditional commitment with the proviso that the licence is relinquished if a well is not drilled.

Note that Drill-or-Drop and Contingent work programmes (subject to further studies by the licensees) will probably result in a well being drilled in less than 50% of the cases.

[9] Refer to OGA technical guidance and safety and environmental guidance on applications for the 29th Round at: https://www.ogauthority.co.uk/licensing-consents/licensing-rounds/

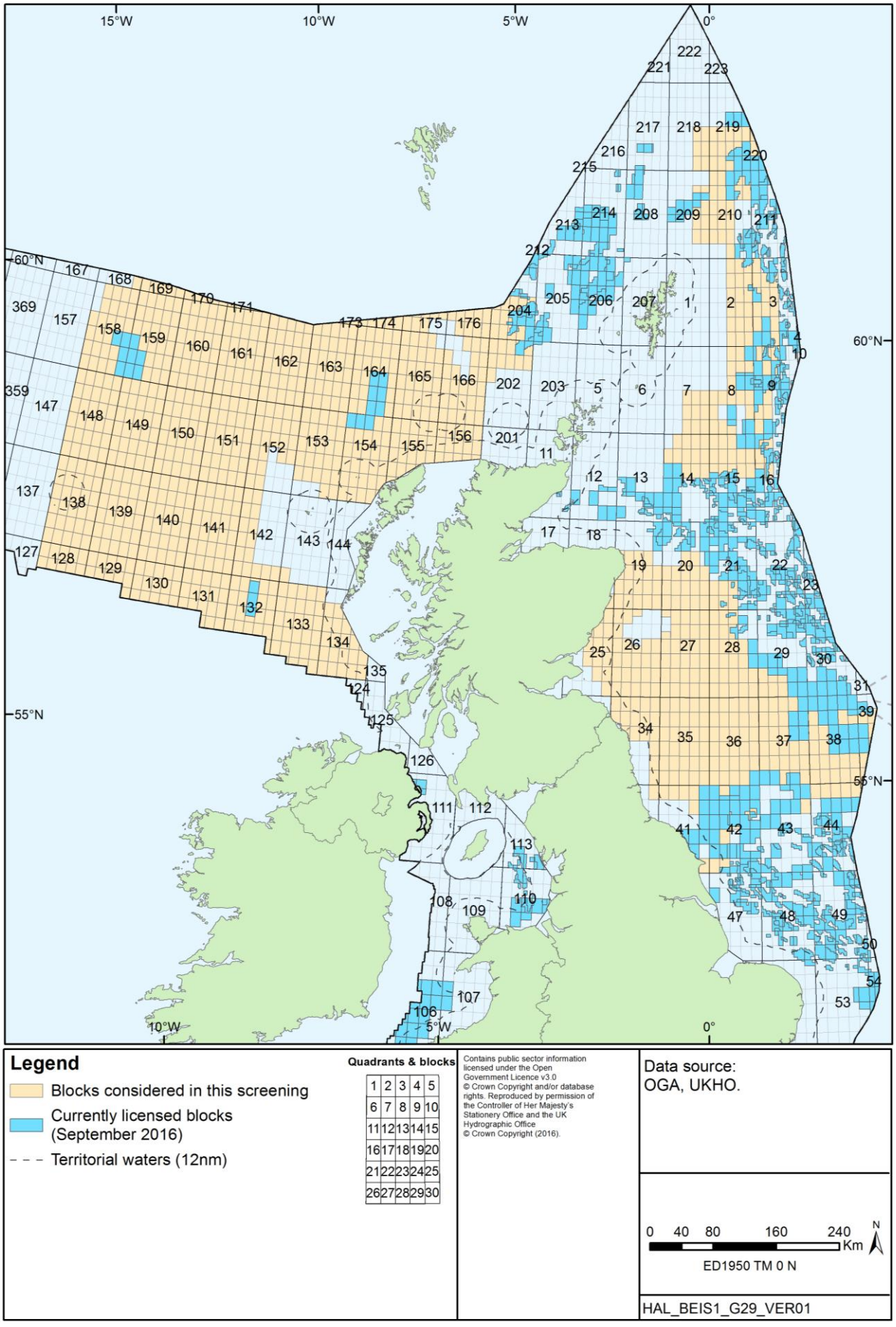
Table 2.1: List of Blocks offered in the 29th Seaward Licensing Round

West of Scotland									
128/1	133/8	139/8	141/29	150/4	153/2	156/8	160/25	163/16	166/19
128/2	133/9	139/9	141/30	150/5	153/3	156/9	160/26	163/17	166/20
128/3	133/10	139/10	142/1	150/6	153/4	156/10	160/27	163/18	166/21
128/4	133/11	139/11	142/2	150/7	153/5	156/11	160/28	163/19	166/22
128/5	133/12	139/12	142/6	150/8	153/6	156/12	160/29	163/20	166/23
128/6	133/13	139/13	142/7	150/9	153/7	156/13	160/30	163/21	166/24
128/7	133/14	139/14	142/11	150/10	153/8	156/14	161/1	163/22	166/25
128/8	133/15	139/15	142/12	150/11	153/9	156/15	161/2	163/23	166/26
128/9	133/16	139/16	142/16	150/12	153/10	158/2	161/3	163/24	166/27
128/10	133/17	139/17	142/17	150/13	153/11	158/3	161/4	163/25	166/28
129/1	133/18	139/18	142/21	150/14	153/12	158/4	161/5	163/26	166/29
129/2	133/19	139/19	142/22	150/15	153/13	158/5	161/6	163/27	166/30
129/3	133/20	139/20	142/26	150/16	153/14	158/7	161/7	163/28	168/30
129/4	133/21	139/21	142/27	150/17	153/15	158/8	161/8	163/29	169/26
129/5	133/22	139/22	142/28	150/18	153/16	158/9	161/9	163/30	169/27
129/6	133/23	139/23	142/29	150/19	153/17	158/10	161/10	164/1	169/28
129/7	133/24	139/24	142/30	150/20	153/18	158/11	161/11	164/2	169/29
129/8	133/25	139/25	143/26	150/21	153/19	158/12	161/12	164/3	169/30
129/9	133/27	139/26	148/1	150/22	153/20	158/13	161/13	164/4	170/26
129/10	133/28	139/27	148/2	150/23	153/21	158/14	161/14	164/5	170/27
129/15	133/29	139/28	148/3	150/24	153/22	158/15	161/15	164/6	170/28
130/1	133/30	139/29	148/4	150/25	153/23	158/16	161/16	164/7	170/29
130/2	134/6	139/30	148/5	150/26	153/24	158/17	161/17	164/8	170/30
130/3	134/7	140/1	148/6	150/27	153/25	158/18	161/18	164/9	171/26
130/4	134/8	140/2	148/7	150/28	153/29	158/21	161/19	164/10	171/27
130/5	134/11	140/3	148/8	150/29	153/30	158/22	161/20	164/11	171/28
130/6	134/12	140/4	148/9	150/30	154/4	158/23	161/21	164/12	171/29
130/7	134/13	140/5	148/10	151/1	154/5	158/24	161/22	164/13	171/30
130/8	134/14	140/6	148/11	151/2	154/6	158/26	161/23	164/14	173/28
130/9	134/16	140/7	148/12	151/3	154/7	158/27	161/24	164/15	173/29
130/10	134/17	140/8	148/13	151/4	154/8	158/28	161/25	164/16	173/30
130/11	134/18	140/9	148/14	151/5	154/9	158/29	161/26	164/17	174/26
130/12	134/19	140/10	148/15	151/6	154/10	159/1	161/27	164/20	174/27
130/13	134/20	140/11	148/16	151/7	154/11	159/2	161/28	164/21	174/28
130/14	134/21	140/12	148/17	151/8	154/12	159/3	161/29	164/22	174/29
130/15	134/22	140/13	148/18	151/9	154/13	159/4	161/30	164/25	174/30
131/1	134/23	140/14	148/19	151/10	154/14	159/5	162/1	164/26	175/21
131/2	134/24	140/15	148/20	151/11	154/15	159/6	162/2	164/27	175/22
131/3	134/25	140/16	148/21	151/12	154/16	159/7	162/3	164/30	175/23
131/4	134/26	140/17	148/22	151/13	154/17	159/8	162/4	165/1	175/24
131/5	134/27	140/18	148/23	151/14	154/18	159/9	162/5	165/2	175/25
131/6	134/28	140/19	148/24	151/15	154/19	159/10	162/6	165/3	175/26
131/7	134/29	140/20	148/25	151/16	154/20	159/11	162/7	165/4	175/27

131/8	134/30	140/21	148/26	151/17	154/21	159/12	162/8	165/6	175/28
131/9	138/1	140/22	148/27	151/18	154/22	159/13	162/9	165/7	176/20
131/10	138/2	140/23	148/28	151/19	154/23	159/14	162/10	165/8	176/21
131/11	138/3	140/24	148/29	151/20	154/24	159/15	162/11	165/9	176/22
131/12	138/4	140/25	148/30	151/21	154/25	159/17	162/12	165/10	176/23
131/13	138/5	140/26	149/1	151/22	154/26	159/18	162/13	165/11	176/24
131/14	138/6	140/27	149/2	151/23	154/27	159/19	162/14	165/12	176/25
131/15	138/7	140/28	149/3	151/24	154/28	159/20	162/15	165/13	176/27
131/18	138/8	140/29	149/4	151/25	154/29	159/23	162/16	165/14	176/28
131/19	138/9	140/30	149/5	151/26	154/30	159/24	162/17	165/15	176/29
131/20	138/10	141/1	149/6	151/27	155/1	159/25	162/18	165/16	176/30
132/1	138/11	141/2	149/7	151/28	155/2	159/28	162/19	165/17	202/1
132/2	138/12	141/3	149/8	151/29	155/3	159/29	162/20	165/18	202/2
132/3b	138/13	141/4	149/9	151/30	155/4	159/30	162/21	165/19	202/3
132/4	138/14	141/5	149/10	152/1	155/5	160/1	162/22	165/20	202/4b
132/5	138/15	141/6	149/11	152/2	155/6	160/2	162/23	165/21	202/5b
132/6	138/16	141/7	149/12	152/3	155/7	160/3	162/24	165/22	202/6
132/7	138/17	141/8	149/13	152/4	155/8	160/4	162/25	165/23	202/7
132/9	138/18	141/9	149/14	152/5	155/9	160/5	162/26	165/24	202/8
132/10	138/19	141/10	149/15	152/6	155/10	160/6	162/27	165/25	202/9
132/11	138/20	141/11	149/16	152/7	155/11	160/7	162/28	165/26	202/10
132/12	138/21	141/12	149/17	152/8	155/12	160/8	162/29	165/27	202/11
132/13b	138/22	141/13	149/18	152/9	155/13	160/9	162/30	165/28	204/16
132/14	138/23	141/14	149/19	152/10	155/14	160/10	163/1	165/29	204/17
132/15	138/24	141/15	149/20	152/11	155/15	160/11	163/2	165/30	204/18
132/16	138/25	141/16	149/21	152/12	155/16	160/12	163/3	166/3	204/19c
132/17	138/26	141/17	149/22	152/13	155/17	160/13	163/4	166/4	204/20c
132/18	138/27	141/18	149/23	152/14	155/18	160/14	163/5	166/5	204/21
132/19	138/28	141/19	149/24	152/15	155/19	160/15	163/6	166/6	204/22b
132/20	138/29	141/20	149/25	152/16	155/21	160/16	163/7	166/9	204/23b
132/25	138/30	141/21	149/26	152/17	155/22	160/17	163/8	166/10	204/26
133/1	139/1	141/22	149/27	152/19	156/1	160/18	163/9	166/11	204/27
133/2	139/2	141/23	149/28	152/20	156/2	160/19	163/10	166/12	204/28a
133/3	139/3	141/24	149/29	152/21	156/3	160/20	163/11	166/14	204/28b
133/4	139/4	141/25	149/30	152/22	156/4	160/21	163/12	166/15	204/29b
133/5	139/5	141/26	150/1	152/26	156/5	160/22	163/13	166/16	
133/6	139/6	141/27	150/2	152/27	156/6	160/23	163/14	166/17	
133/7	139/7	141/28	150/3	153/1	156/7	160/24	163/15	166/18	
Northern North Sea									
2/3	2/25	3/23	8/10b	9/3c	14/9	15/13b	209/15	210/12	219/16
2/4b	2/28	3/28c	8/13	9/3d	14/10	15/14	209/19	210/13	219/17
2/5b	2/29	7/18	8/16	9/7	14/13	15/15	209/20	210/16	219/18
2/5d	2/30	7/19	8/17	9/8c	14/14	16/1c	209/24	210/17	219/19
2/8	3/1a	7/20	8/18	9/17b	14/15	16/2a	209/25	210/18	219/20
2/9	3/6	7/23	8/19	9/21b	15/1	16/6b	210/1	210/21	219/21
2/10a	3/7c	7/24	8/20	9/22	15/2	16/7c	210/2	210/22	219/22

2/13	3/8c	7/25	8/21	9/26	15/3	16/7d	210/4a	210/23	219/23b
2/14	3/11c	7/28	8/25	14/2	15/6	16/7e	210/5a	210/28	219/24b
2/15b	3/12	7/29	8/26	14/3	15/7	16/11a	210/5b	218/19	219/26
2/18	3/13b	7/30	8/27	14/4	15/8	16/12b	210/6	218/20	219/27
2/19	3/16	8/3	8/28b	14/5	15/9	16/12c	210/7	218/24	219/28b
2/20	3/17	8/4	9/1a	14/6	15/10	209/9b	210/9a	218/25	220/16
2/23	3/18	8/8	9/2d	14/7	15/11b	209/10b	210/10	218/29	220/21
2/24	3/21	8/9b	9/2e	14/8	15/12c	209/14b	210/11	218/30	220/22
Mid North Sea High									
18/30	20/23	26/2	27/7	28/13	34/5	35/16	36/15	37/20	39/17
19/11	20/24	26/3b	27/8	28/14	34/6	35/17	36/16	37/21	39/21
19/12	20/25	26/6	27/9	28/16	34/7	35/18	36/17	37/22	39/26
19/13	20/26	26/11	27/10	28/17	34/8	35/19	36/18	37/23	40/5
19/14	20/27	26/12	27/11	28/18	34/9	35/20	36/19	37/24	41/1
19/16	20/28	26/13b	27/12	28/19	34/10	35/21	36/20	37/25	41/2
19/17	20/29	26/14	27/13	28/21	34/12	35/22	36/21	37/28b	41/3
19/18	20/30	26/15	27/14	28/22	34/13	35/23	36/22	37/29b	41/4
19/19	21/21	26/16	27/15	28/23	34/14	35/24	36/23	37/30	41/9
19/20	21/22	26/17	27/16	28/24	34/15	35/25	36/24	38/6	41/29a
19/21	21/23a	26/18	27/17	28/25	34/17	35/26	36/25	38/9	41/29b
19/22	21/26	26/19	27/18	28/26	34/20	35/27	36/26	38/10b	41/30
19/23	21/27b	26/20	27/19	28/27	34/25	35/28	36/27	38/11	42/2a
19/24	21/28b	26/21	27/20	28/28	34/30	35/29	36/28	38/12	42/8a
19/25	25/4	26/22	27/21	28/29	35/1	35/30	36/29	38/16	42/9a
19/26	25/5	26/23	27/22	28/30	35/2	36/1	37/1	38/17	42/10c
19/27	25/8	26/24	27/23	28/2a	35/3	36/2	37/2	38/21	42/13b
19/28	25/9	26/25	27/24	28/3a	35/4	36/3	37/3	38/22	42/14a
19/29	25/10	26/26	27/25	28/8b	35/5	36/4	37/4	38/23	42/17
19/30	25/13	26/27	27/26	29/21	35/6	36/5	37/6	38/24	42/26
20/13	25/14	26/28	27/27	29/22b	35/7	36/6	37/7	38/25	42/27b
20/14	25/15	26/29	27/28	29/23b	35/8	36/7	37/8	38/26	43/10
20/16	25/18	26/30	27/29	29/26	35/9	36/8	37/11	38/27	44/1
20/17	25/19	27/1b	27/30	29/27	35/10	36/9	37/12	38/28	44/2
20/18	25/20	27/2	28/1	29/28	35/11	36/10	37/13	38/29	44/3
20/19	25/24	27/3	28/6	34/1	35/12	36/11	37/16	38/30	44/4
20/20	25/25	27/4	28/7	34/2	35/13	36/12	37/17	39/6b	44/5
20/21	25/30	27/5	28/11	34/3	35/14	36/13	37/18	39/7b	45/1
20/22	26/1	27/6b	28/12	34/4	35/15	36/14	37/19	39/12	

Figure 2.1: Location of Blocks offered in the context of existing licences



The OGA technical guidance makes it clear that an award of a Production Licence does not automatically allow a licensee to carry out all petroleum-related activities from then on (this includes those activities outlined in initial work programmes, particularly Phases B and C). Activities in the field (see Table 2.2) associated with seismic survey or drilling are subject to relevant activity specific environmental assessments by BEIS, and there are other regulatory provisions exercised by bodies such as the Health and Safety Executive. It is the licensee's responsibility to be aware of, and comply with, all regulatory controls and legal requirements.

The proposed work programmes for the Initial Term are detailed in the licence applications. For some activities, such as seismic survey noise, the impacts can occur some distance from the licensed Blocks and the degree of activity is not necessarily proportional to the size or number of Blocks in an area. In the case of direct physical disturbance, the licence Blocks being applied for are relevant.

2.3.1 Likely scale of activity

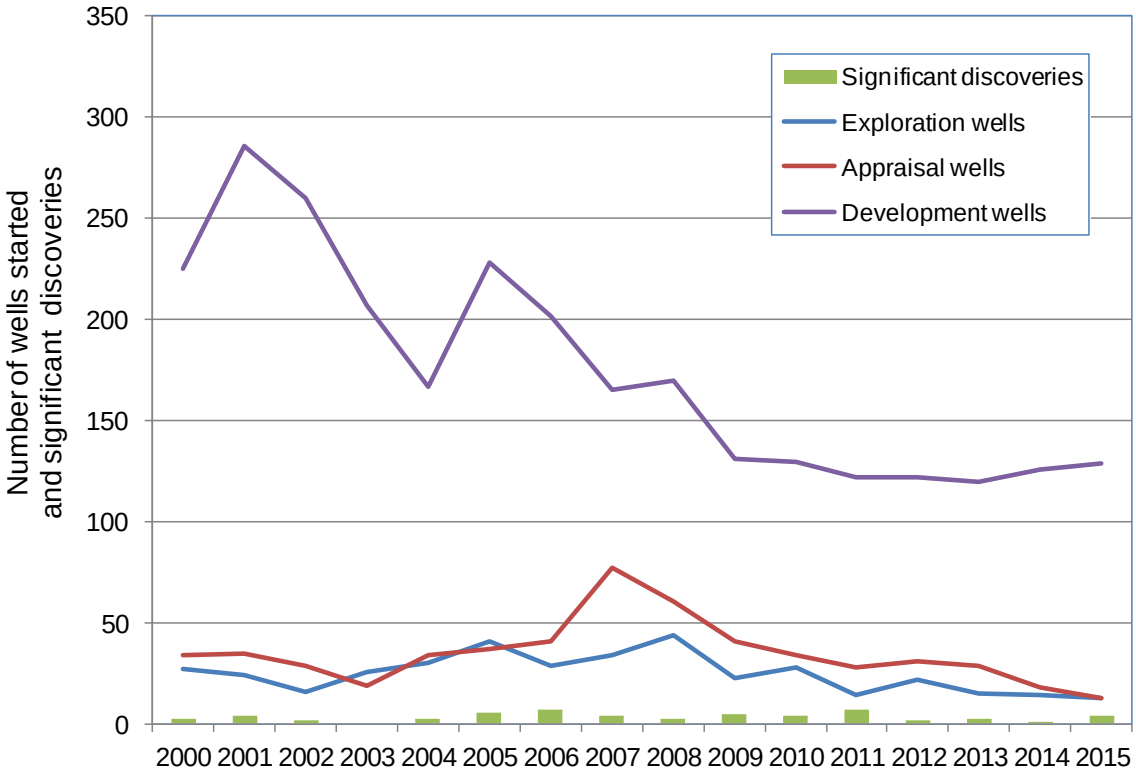
This assessment has been undertaken at the stage at which Blocks are offered for licensing. To place the scale of the 29th Round in context, rounds of comparable size (i.e. in terms of number of Blocks offered, such as the 22nd-24th Rounds) have attracted applications for between 16% and 21% of the Blocks offered. On past experience the activity that actually takes place is less than is bid at the licence application stage. A proportion of Blocks awarded may be relinquished without any field activities occurring. Activity after the Initial Term is much harder to predict, as this depends on the results of the initial phase, which is, by definition, exploratory. Typically less than half the wells drilled reveal hydrocarbons, and of that, less than half again will have a potential to progress to development. For example, the OGA analysis of exploration well outcomes from the Moray Firth & Central North Sea between 2003 and 2013 indicated an overall technical success rate of 40% with respect to 150 exploration wells and side-tracks (Mathieu 2015). Depending on the expected size of finds, there may be further drilling to appraise the hydrocarbons (appraisal wells). For context, Figure 2.2 highlights the total number of exploration and appraisal wells started on the UKCS each year since 2000 as well as the number of significant discoveries made (associated with exploration activities).

Discoveries that progress to development may require further development drilling, installation of infrastructure such as wellheads, pipelines and possibly fixed platform production facilities, although recent developments are mostly tiebacks to existing production facilities rather than stand alone developments. For example, of the 55 current projects identified by the OGA's Project Pathfinder (as of 19th July 2016)[10], 26 are planned as subsea tie-backs to existing infrastructure, 8 involve new stand alone production platforms and 10 are likely to be developed via Floating Production, Storage and Offloading facilities (FPSO). The final form of development for many of the remaining projects is not decided, with some undergoing re-evaluation of development options but some are likely to be subsea tie-backs. Figure 2.2 indicates that the number of development wells has declined over time and this pattern is likely

[10] https://itportal.decc.gov.uk/eng/fox/path/PATH_REPORTS/pdf

to continue. The nature and scale of potential environmental impacts from the drilling of development wells are similar to those of exploration and appraisal wells and thus the screening criteria described in Section 4 are applicable to the potential effects of development well drilling within any of the 29th Round Blocks.

Figure 2.2: UKCS Exploration, appraisal & development wells, and significant discoveries since 2000



Note: The description "significant" generally refers to the flow rates that were achieved (or would have been reached) in well tests (15 mmcfgd or 1000 BOPD). It does not indicate the commercial potential of the discovery.

Source: OGA Drilling Activity (October 2016), Significant Offshore Discoveries (August 2016)

2.3.2 29th Round activities considered by the HRA

The nature, extent and timescale of development, if any, which may ultimately result from the licensing of 29th Round Blocks is uncertain, and therefore it is regarded that at this stage a meaningful assessment of development level activity (e.g. pipelay, placement of jackets, subsea templates or floating installations) cannot be made. Moreover, once project plans are in place, subsequent permitting processes relating to exploration, development and decommissioning, would require assessment (including HRA) as appropriate, allowing the opportunity for further mitigation measures to be identified as necessary, and for permits to be refused if necessary. In this way the opinion of the Advocate General in ECJ (European Court of Justice) case C-6/04, on the effects on Natura sites, "*must be assessed at every relevant stage of the procedure to the extent possible on the basis of the precision of the plan. This assessment is to be updated with increasing specificity in subsequent stages of the procedure*" is addressed. Therefore only activities as part of the work programmes associated with the Initial Term and its associated Phases A-C will be considered in this HRA.

For the purposes of this screening assessment, the implications of geophysical survey and drilling are considered in a generic way for all the Blocks offered; a generic description of the nature and scale of these activities is given in Table 2.2 below. The screening assessment considers:

- The potential disturbance and drilling effects associated with the drilling of an exploration well within each Block offered.
- The potential acoustic disturbance effects associated with undertaking a deep geological seismic survey within each Block offered (as well as undertaking site specific seismic operations including rig site survey and Vertical Seismic Profiling).
- The potential for in-combination effects.

Subsequent Appropriate Assessment (AA) of Blocks for which a likely significant effect cannot currently be excluded will consider a generic approach based on the maximum likely work programme associated with the Initial Term and its associated Phases A-C.

Table 2.2: Indicative overview of potential activities that could arise from Block licensing

Potential activity	Description
Geophysical survey	
Deep geological seismic (2D and 3D) survey	2D seismic involves a survey vessel with a single source and a towed hydrophone streamer (up to 12 km long), containing several hydrophones along its length. The reflections from the subsurface strata provide an image in two dimensions (horizontal and vertical). Repeated parallel lines are typically run at intervals of several kilometres (minimum *ca*. 0.5km) and a second set of lines at right angles to the first to form a grid pattern. This allows imaging and interpretation of geological structures and identification of potential hydrocarbon reservoirs. 3D seismic survey is similar but uses more than one source and several hydrophone streamers towed by the survey vessel. Thus closely spaced 2D lines (typically between 25 and 75m apart) can be achieved by a single sail line. These deep-geological surveys tend to cover large areas (300-3000km^2) and may take from several days up to several weeks to complete. Typically, large airgun arrays are employed with 12-48 airguns and a total array volume of 3000-8000 in^3.
Rig site survey	Rig site surveys are undertaken to identify seabed and subsurface hazards to drilling, such as wrecks and the presence of shallow gas. The surveys use a range of techniques, including multibeam and side scan sonar, sub-bottom profiler, magnetometer and high-resolution seismic involving a much smaller source (mini-gun or four airgun cluster of 160in^3) and a much shorter hydrophone streamer. The survey typically covers 2-3km^2. The rig site survey vessel may also be used to characterise seabed habitats, biota and background contamination. Survey durations are usually of the order of four or five days.
Well evaluation (e.g. Vertical Seismic Profiling)	Sometimes conducted to assist with well evaluation by linking rock strata encountered in drilling to seismic survey data. A seismic source (airgun array, typically with a source size around 500 in^3 and with a maximum of 1200 in^3) is deployed from the rig, and measurements are made using a series of geophones deployed inside the wellbore. VSP surveys are of short duration (one or two days at most).
Drilling	
Rig tow out & de-mobilisation	Mobile rigs are towed to and from the well site typically by 2-3 anchor handling vessels.
Rig placement/ anchoring	Semi-submersible rigs use either anchors (deployed and recovered by anchor handler vessels) or dynamic positioning (DP) to manoeuvre into and stay in position over the well location. Eight to 12 anchors attached to the rig by cable or chain are deployed radially from the rig (at up to 1.5km in the North Sea and 3km in deep waters to the west of the UK); part of the anchoring hold is provided by a proportion of the cables or chains lying on the seabed (catenary). In the deepest waters to the west of the UK DP drill ships are typically used. Jack-up rigs are used in shallower waters (normally <120m) and jacking the rig legs to the seabed supports the drilling deck. Each of the rig legs terminates in a spud-can (base plate) with a diameter of 15-20m to prevent excessive sinking into the seabed.
Marine discharges	Typically around 1,000 tonnes of cuttings (primarily rock chippings) result from drilling an exploration well. Water-based mud cuttings are typically discharged at, or relatively close to sea surface during “closed drilling” (i.e. when steel casing in the well bore and a riser to the rig are in place), whereas surface hole cuttings are normally discharged at seabed during “open-hole” drilling. Use of oil based mud systems, for example in highly deviated sections or in drilling water reactive shales, would require onshore or alternative drilling waste disposal.
Rig/vessel presence and movement	On site, the rig is supported by supply and standby vessels. Supply vessels typically make 2-3 supply trips per week between rig and shore. Helicopter trips to transfer personnel to and from the rig are typically made several times a week.

3 Relevant Natura 2000 sites

Sites were considered for inclusion/exclusion in the screening process with respect to whether there was a pathway for interaction[11] between the marine features for which they are designated and potential exploration/appraisal activities which could arise following Block licensing (see Table 2.2). Sites considered include designated Natura 2000 sites and potential sites for which there is adequate information on which to base an assessment.

Guidance in relation to sites which have not yet been submitted to the European Commission is given by Circular 06/2005 (ODPM 2005) which states that: "*Prior to its submission to the European Commission as a cSAC, a proposed SAC (pSAC) is subject to wide consultation. At that stage it is not a European site and the Habitats Regulations do not apply as a matter of law or as a matter of policy. Nevertheless, planning authorities should take note of this potential designation in their consideration of any planning applications that may affect the site*." However, in accordance with the National Planning Policy Framework (DCLG 2012), devolved policy (e.g. Scottish Planning Policy) and Marine Policy Statement (HM Government 2011), the relevant sites considered here include classified and potential SPAs, designated and candidate SACs and Sites of Community Importance (SCIs). In addition to the above sites, the Scottish Government recently completed consultation on 10 proposed marine SPA sites and began consultation on another 4 in October 2016[12]. Natural England have also completed consultation on a number of proposed SPA sites[13] and with JNCC, commenced consultation on the Greater Wash pSPA in October 2016[14]. The full details of all sites including their type, status and qualifying features are provided in Appendix A.

If further Natura 2000 sites are established during this HRA process, they will be subject to screening and if necessary included in subsequent Appropriate Assessment stages. The primary sources of site data were the latest JNCC SAC[15] (version as of 24th October 2016) and SPA[16] (version as of 24th October 2016) summary data and interest features and site characteristics were filtered for their coastal and marine relevance. The websites of the relevant Statutory Nature Conservation Bodies (SNCBs) were also reviewed to verify and

[11] Based on knowledge of potential sources of effect resulting from the activities (from previous BEIS AAs and SEAs), and pathways by which these effects may impact receptors present on the site (from previous BEIS AAs and SEAs, Regulation 33/35 advice and literature sources etc). Also refer to Section 4.2.

[12] http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/proposed-marine-spas/

[13] https://www.gov.uk/government/collections/marine-special-protection-area-consultations

[14] https://consult.defra.gov.uk/natural-england-marine/greater-wash-potential-special-protection-area-com

[15] http://jncc.defra.gov.uk/page-1461

[16] http://jncc.defra.gov.uk/page-1409

augment site information including SNH[17], Natural England[18,19] and Department of Agriculture, Environment and Rural Affairs (DAERA)[20]. Any sites designated in the future would also be considered as necessary in subsequent project specific assessments.

The sites included in the screening process include:

- Coastal and marine Natura 2000 sites along the coasts of the United Kingdom and in territorial waters
- Offshore Natura 2000 sites (i.e. those largely or entirely beyond 12nm from the coast)
- Riverine Natura 2000 sites designated for migratory fish and/or the freshwater pearl mussel
- Relevant sites in adjacent states
- Coastal Ramsar sites

A number of Natura 2000 sites are designated for mobile species (seabirds, marine mammals and fish) which may be present beyond site boundaries. These are considered in Section 4.5.

In addition, Natura 2000 sites in the waters of other member states at or adjacent to the UK median line have been considered. All relevant sites are shown in Figures 3.1 and 3.2 overleaf and larger scale maps of the Blocks offered and sites together with site details can be found in Appendix A.

[17] http://gateway.snh.gov.uk/sitelink/index.jsp

[18] http://publications.naturalengland.org.uk/category/6490068894089216

[19] https://www.gov.uk/government/collections/conservation-advice-packages-for-marine-protected-areas

[20] https://www.daera-ni.gov.uk/topics/biodiversity-land-and-landscapes/protected-areas

Figure 3.1: SPAs included in the screening process

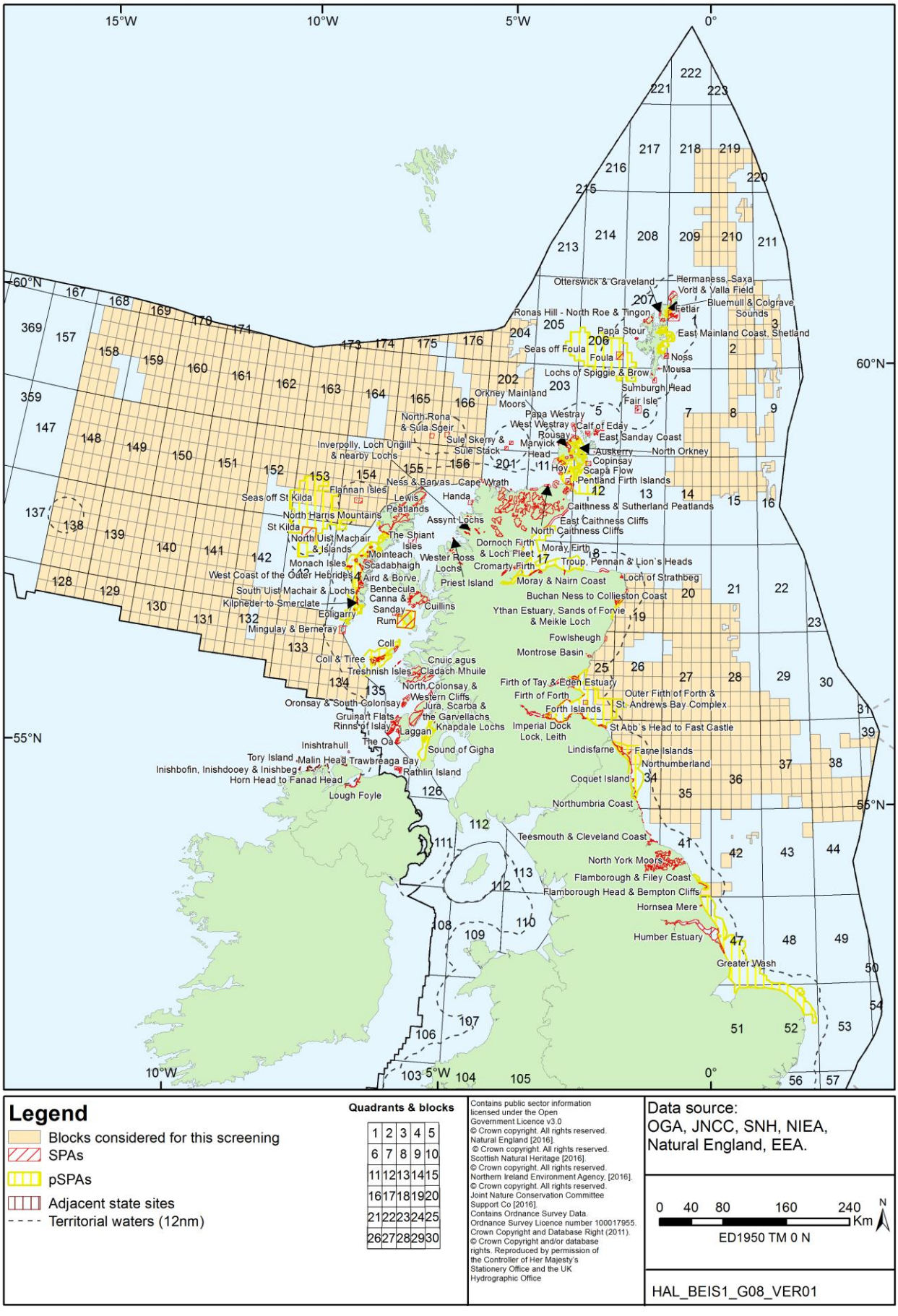
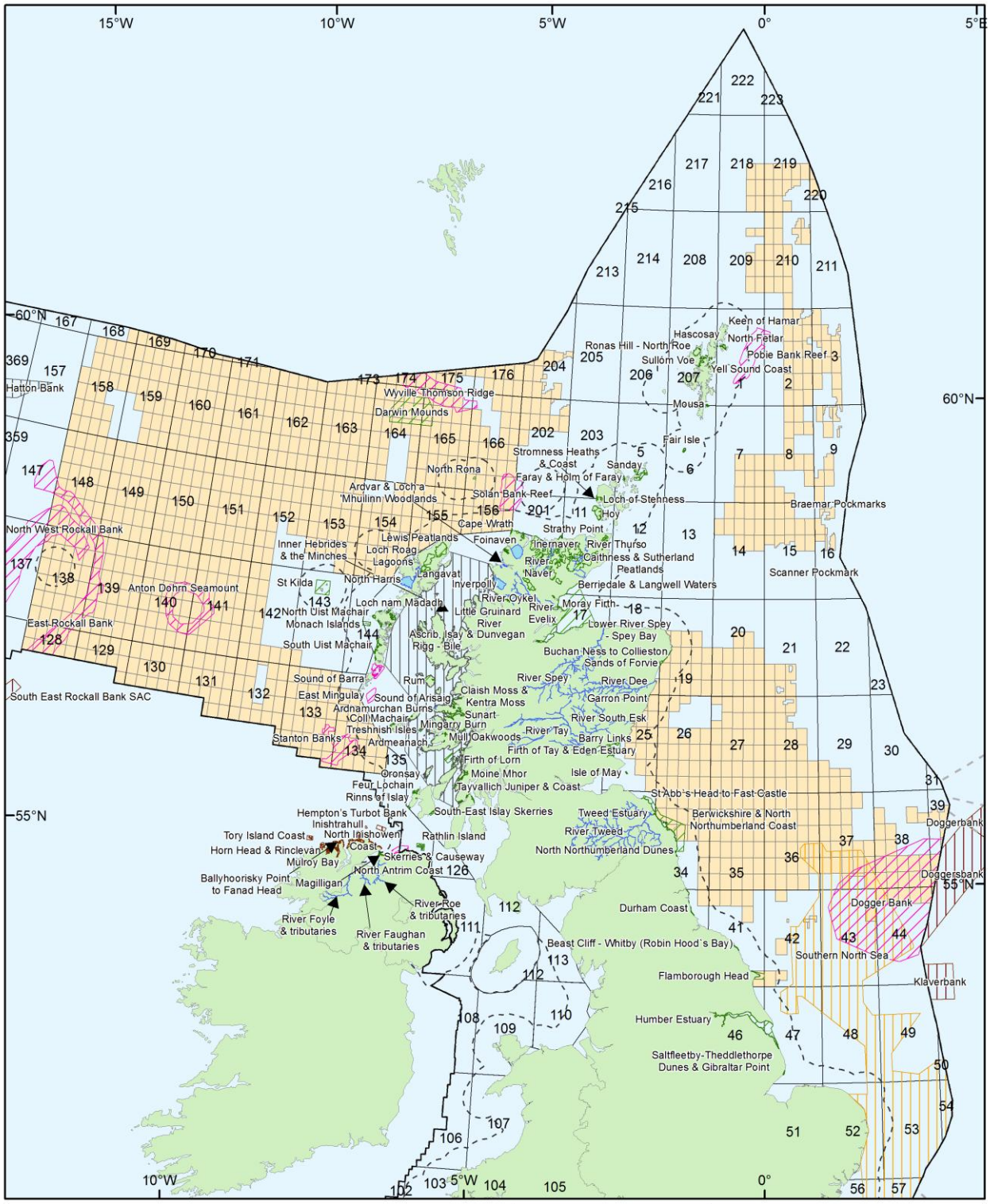


Figure 3.2: SACs included in the screening process



4 Screening Assessment Process

4.1 Introduction

This screening assessment is the first stage of an HRA to determine whether licensing of any of the Blocks offered in the 29th Round is likely to have a significant effect on a relevant European site, either individually or in combination with other plans or projects. The approach to the screening assessment has been undertaken in accordance with the European Commission Guidance (EC 2000) augmented by reference to the range of other guidance and reports (see list in Section 1.3).

The approach taken to screening has been to:

- Define the likely location and nature of exploration/appraisal activities that could follow licensing, together with their potential to result in likely significant effects on European sites – see Section 2.
- Identify all relevant European sites and their qualifying primary and non-primary features with the potential to be affected by exploration/appraisal activities (i.e. those sites with marine features or with a marine ecological linkage) – see Section 3 and Appendix A.
- Screen the relevant sites for the likelihood of significant effects that could result from the licensing of individual Blocks offered, based on the nature and scale of potential effects from exploration and appraisal activities in a geographic information system (GIS) – see Section 5. Consideration is also given as appropriate to the potential for mobile species (e.g. seabirds, marine mammals and fish) to be present beyond relevant site boundaries, the site conservation objectives and specific advice on operations.
- Screen the relevant sites for likely significant effects that could result from the licensing of individual Blocks offered, in combination with other marine activities and plans – see Section 5.
- Those Blocks which are screened in (i.e. for which likely significant effects on relevant European sites could not be discounted at the screening stage) will be subject to a second stage of HRA, Appropriate Assessment, before decisions on whether to grant licences are taken – see Section 6 and Appendix B.

4.2 Sources of effect considered in this screening

As outlined in Section 2.3, activities which may be undertaken during the initial term of a Seaward Production Licence will comprise exploration/appraisal in the form of seismic survey and drilling. The foreseeable interactions from these two activities with the potential to result in likely significant effects on relevant Natura 2000 sites are therefore assessed in this report.

These activities, their environmental effects, and relevant legal and other controls are extensively described in the previous SEA Environmental and Technical Reports[21] and are not duplicated in detail here.

Subsequent field development activity is contingent on successful exploration and appraisal and may or may not result in the eventual installation of infrastructure. Where relevant, such future activities will themselves be subject to a screening procedure and tests under the Habitats Directive.

Regulation 33 Advice[22] (now Regulation 35 under the *Conservation of Habitats and Species Regulations 2010*) was taken into account since it includes advice on operations that may cause deterioration or disturbance to relevant features or species. In addition, significant work has been undertaken in the area of sensitivity assessments and activity/pressure matrices in recent years (e.g. Tillin *et al*. 2010) resulting in agreed lists of pressures at a UK and North East Atlantic level (the OSPAR Intersessional Correspondence Group on Cumulative Effects (ICG-C), see Tillin & Tyler-Walters 2014). Defra (2015) includes an evidence base for the latest pressures-activity matrix produced by JNCC (2013). These are intended to be representative of the types of pressures that act on marine species and habitats from a defined set of activities, based on benchmarks of these pressures where the magnitude, extent or duration is qualified or quantified in some way. Whilst these matrices are informative and note many of the pressures associated with hydrocarbon exploration, resultant effects are not inevitable consequences of oil and gas activity since often they can be mitigated through timing, siting or technology (or a combination of these). The Department expects that these options would be evaluated by the licensees and documented in the environmental assessments required as part of the activity specific consenting regime.

A consideration of the potential for the above activities to result in likely significant effects was made, informed by the evidence base in the scientific literature, relevant BEIS Strategic Environmental Assessments, and recent Environmental Statements for the relevant activities. Based on this consideration, this screening assessment addresses those sources of impact generally considered to have the potential to affect relevant Natura 2000 sites, specifically:

- Physical disturbance and drilling effects (e.g. rig siting, marine discharges, rig/vessel presence and movement)
- Underwater noise
- In-combination effects

[21] https://www.gov.uk/guidance/offshore-energy-strategic-environmental-assessment-sea-an-overview-of-the-sea-process

[22] Under this Regulation, advice must be provided by the appropriate nature conservation body to other relevant authorities as to: a European site's conservation objectives and any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated.

Potential accidental events, including spills, are not considered in this HRA screening as they are not part of the work plan. Measures to prevent accidental events, response plans and potential impacts in the receiving environment would be considered as part of the environmental impact assessment process for specific projects that could follow licensing when the location, nature and timing of the proposed activities are available to inform a meaningful assessment of such risks.

Sections 4.3-4.5 provide more detail on the activities relevant to exploration, sources of effect relating to these (including summaries or references to relevant literature as appropriate), and how these have informed a set of screening criteria used to identify Blocks which should be considered further.

Mandatory controls and required mitigation measures are in place for each of the broad sources of effect listed above. This HRA screening assumes that the high level controls listed in Table 4.1 are applied as standard to activities since they are legislative requirements which if not adhered to would constitute an offence. These are distinct from further mitigation measures which may be identified and employed to avoid likely significant effects on relevant sites.

Table 4.1: High level controls identified for potential sources of effect

Source of effect	High level controls
Physical disturbance	There is a mandatory requirement to have sufficient recent data to characterise the seabed in areas where activities are due to take place (e.g. rig placement). If required, survey reports must be made available to the relevant statutory bodies on submission of a relevant permit application or Environmental Statement for the operation to be undertaken, and the identification of sensitive habitats by such survey (including those under Annex I of the Habitats Directive) may affect BEIS's decision with regards to project level consent. Further mitigation (e.g. alternative well location or rig positioning) may need to be identified and implemented where necessary.
Marine discharges	Discharges from offshore oil and gas facilities have been subject to increasingly stringent regulatory controls over recent decades (see review in DECC 2016, and related Appendices 2 and 3). Discharges of oil and other contaminant concentrations in waste streams (drilling wastes and produced water) have been substantially reduced or eliminated (e.g. the discharge of oil based muds and contaminated cuttings is effectively banned), with discharges of chemicals and oils outwith regulatory standards or permit conditions constituting an offence. Discharges are effectively controlled through permitting, monitoring and reporting (e.g. through the mandatory Environmental and Emissions Monitoring System (EEMS) and annual environmental performance reports). At the project level, discharges would be considered in detail in project-specific Environmental Statements, HRAs (where necessary) and chemical risk assessments under existing permitting procedures.

Source of effect	High level controls
Acoustic disturbance	Proposals to undertake seismic surveys are subject to an application for consent. As part of the application process, licensees must justify that their proposed activity is not likely to cause a disturbance etc. under the *Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001* (as amended) and *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007* (as amended). It is a condition of any consent issued under Regulation 4 of the *Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001* (& 2007 amendments) for oil and gas related seismic surveys that the JNCC, *Guidelines for minimising the risk of disturbance and injury to marine mammals from seismic surveys,* are followed. Passive acoustic monitoring (PAM) may be required as a mitigation tool. BEIS will take account of the advice provided by the relevant statutory nature conservation body in determining any additional consent conditions. Potential disturbance of certain species may be avoided by the timing of noisy activities, and periods of seasonal concern for individual Blocks on offer have been highlighted (see Section 2 of OGA's Other Regulatory Issues[23] which accompanied the 29th Round offer) which licensees should take account of. Licensees should also be aware that it may influence BEIS's decision whether or not to approve particular activities.

4.3 Physical disturbance and drilling effects

4.3.1 Direct physical disturbance

The main sources of physical disturbance of the seabed from oil and gas exploration and appraisal activities are:

- Anchoring of semi-submersible rigs. Semi-submersible rigs typically use anchors to hold position, typically between 8 and 12 in number at a radius related to water depth, seabed conditions and anticipated metocean conditions. The seabed footprint associated with semi-submersible rig anchoring results from a combination of anchor scars caused by anchors dragging before gaining a firm hold, and scraping by the cable and/or chain linking the anchor to the rig, where these touch the seabed (the catenary contact). In relatively shallow North Sea depths, rig anchors extend to a radius of up to *ca*. 1,500m (note that semi-submersible rigs are typically not used in water depths of less than 120m). In contrast, in the Faroe-Shetland Chanel, a rig drilling in 1,200m water depth had anchors extending to a radius of some 2,750m (which accords with Gulf of Mexico experience, see CSA 2006). In the deeper waters to the west of the UK, the use of anchors can be largely negated through the use of dynamically positioned (DP) drill ships or DP semi-submersible rigs. These use a number of thrusters and accurate positioning information to maintain their station. For the purposes of this screening assessment, physical disturbance of the seabed to a maximum distance of 3km from a rig has been assumed.

[23] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/540493/29R_Other_Regulatory_Issues.pdf

- Placement of jack-up rigs. Jack-up rigs, normally used in shallower water (<120m), leave three or four seabed depressions from the feet of the rig (the spud cans) around 15-20m in diameter. In locations with an uneven or soft seabed, material such as grout bags or rocks may be placed on the seabed to stabilise the rig feet, and recoverable mud mats may be used in soft sediment. A four-legged rig with 20m diameter spudcans would have an approximate seabed footprint of 1,250m^2 within a radius of *ca*. 50m of the rig centre.

- Drilling of wells and wellhead removal. The surface hole sections of exploration wells are typically drilled riserless, producing a localised (and transient) pile of surface-hole cuttings around the surface conductor. The persistence of cuttings discharged at the seabed is largely determined by the potential for it to be swept away by tidal currents. After installation of the surface casing (which will result in a small quantity of excess cement returns being deposited on the seabed), the blowout preventer (BOP) is positioned on the wellhead housing. These operations (and associated activities such as ROV operations) may result in physical disturbance of the immediate vicinity (a few metres) of the wellhead. When an exploration well is abandoned, the conductor and casing are plugged with cement and cut below the mudline (seabed sediment surface) using a mechanical cutting tool deployed from the rig and the wellhead assembly is removed. The seabed "footprint" of the well is therefore removed although post-well sediments may vary in the immediate vicinity of the well compared to the surrounding seabed (see for example, Jones *et al*. (2012)).

4.3.2 Drilling discharges

The extent and potential impact of drilling discharges have been reviewed in successive SEAs (OESEA, OESEA2 and OESEA3 (DECC 2009, 2011 and 2016, respectively)).

In contrast to historic oil based mud discharges[24], effects on seabed fauna of the discharge of cuttings drilled with water based muds (WBM) and of the excess and spent mud itself are usually subtle or undetectable, although the presence of drilling material at the seabed is often detectable chemically close to the drilling location (<500m) (e.g. Cranmer 1988, Neff *et al.* 1989, Hyland *et al.* 1994, Daan & Mulder 1996, Currie & Isaacs 2005, OSPAR 2009, Bakke *et al*. 2013, DeBlois *et al*. 2014). Considerable data has been gathered from the North Sea and other production areas, indicating that localised physical effects are the dominant mechanism of ecological disturbance where water-based mud and cuttings are discharged. Modelling of WBM cutting discharges has indicated that deposition of material is generally thin and quickly reduces away from the well. Jones *et al*. (2006, 2012) compared pre- and post-drilling ROV surveys of an exploration well in the Faroe-Shetland Channel in ~600m water depth and documented physical smothering effects within 100m of the well. Outside the area of smothering, fine sediment was visible on the seafloor up to at least 250m from the well. After 3 years, there was significant removal of cuttings and faunal density within 100m of the well was no longer significantly different from further away.

[24] OSPAR Decision 2000/3 on the Use of Organic-Phase Drilling Fluids (OPF) and the Discharge of OPF-Contaminated Cuttings came into effect in January 2001 and effectively eliminated the discharge of cuttings contaminated with oil based fluids (OBF) greater than 1% by weight on dry cuttings.

OSPAR (2009) concluded that the discharge of drill cuttings and water-based fluids may cause some smothering in the near vicinity of the well location. The impacts from such discharges are localised and transient, but may be of concern in areas with sensitive benthic fauna, for example corals and sponges. Laboratory experiments by Allers *et al.* (2013) indicated that cold water coral (*Lophelia pertusa*) fragments were resilient to sedimentation-induced oxygen stress, but if coverage by sediment was complete and lasted long enough, the coral could not recover and died. Field experiments on the effects of water-based drill cuttings on benthos by Trannum *et al.* (2011) found after 6 months only minor differences in faunal composition between the controls and those treated with drill cuttings. This corresponds with the results of field studies where complete recovery was recorded within 1-2 years after deposition of water-based drill cuttings (Daan & Mulder 1996, Currie & Isaacs 2005).

Standard grade barite, the most commonly used weighting agent in WBMs, was found to alter the filtration rates of four bivalve species (*Modiolus modiolus, Dosinia exoleta, Venerupis senegalensis* and *Chlamys varia*) and to damage the gill structure when exposed to 0.5mm, 1.0mm and 2.0mm daily depth equivalent doses (Strachan 2010, Strachan & Kingston 2012). All three barite treatments altered the filtration rates leading to 100% mortality. The horse mussel (*M. modiolus*) was the most tolerant to standard barite with the scallop (*C. varia*) the least tolerant. Fine barite, at a 2mm daily depth equivalent, also altered the filtration rates of all species, but only affected the mortality of *V. senegalensis*, with 60% survival at 28 days. Field studies undertaken by Strachan (2010) showed that the presence of standard grade barite was not acutely toxic to seabed fauna but did alter benthic community structure when persistent.

Although suspensions of finer particles may be dispersed over greater distances than those of coarser particles, they will also be more dilute and therefore can be expected to have less impact on the marine environment. Although chemically inert, suspended barite has been shown under laboratory conditions to potentially have a detrimental effect on suspension feeding bivalves causing demonstrable damage to the gill filtration system and, after prolonged exposure, mortality. When the suspended barite levels used in laboratory studies are translated to field conditions (i.e. distances from the point of discharge) it is clear that any effects will be very local to a particular installation (in the case of oil and gas facilities, well within 500m).

The chemical formulation of WBM avoids or minimises the inclusion of toxic components, and the materials used in greatest quantities (barite and bentonite) are of negligible toxicity. The bulk of WBM constituents (by weight and volume) are on the OSPAR List of Substances/ Preparations Used and Discharged Offshore Which are Considered to Pose Little or No Risk to the Environment (PLONOR).

4.3.3 Other disturbance

Blocks may support important numbers of seabirds at certain times of the year including overwintering birds and those foraging from coastal SPAs. Therefore, the presence and/or movement of vessels and aircraft from and within Blocks during exploration and appraisal activities could temporarily disturb foraging seabirds from relevant coastal SPA sites.

Physical disturbance of seaduck and other waterbird flocks by vessel and aircraft traffic associated with hydrocarbon exploration and appraisal is possible, particularly in SPAs established for shy species (e.g. common scoter). Such disturbance can result in repeated disruption of bird feeding, loafing and roosting. For example, large flocks of common scoter were observed being put to flight at a distance of 2km from a 35m vessel, though smaller flocks were less sensitive and put to flight at a distance of 1km (Kaiser 2002, also see Schwemmer *et al.* 2011). Larger vessels would be expected to have an even greater disturbance distance (Kaiser *et al.* 2006). With respect to the disturbance and subsequent displacement of seabirds in relation to offshore wind farm (OWF) developments, Natural England & JNCC (2013) interim advice recommended a generic displacement buffer of 2km (to be added to the OWF footprint) for all species with the exception of divers and seaducks, for which a 4km buffer was recommended due to their increased sensitivity.

A significant number of various bird species migrate across the North Sea region twice a year or use the area as a feeding and resting area (OSPAR 2015). Some species crossing or using the area may become attracted to offshore light sources, especially in poor weather conditions with restricted visibility (e.g. low clouds, mist, drizzle, Weise *et al*. 2001), and this attraction can potentially result in mortality through collision (OSPAR 2015). As part of navigation and worker safety, and in accordance with international requirements, drilling rigs and associated vessels are lit at night and the lights will be visible at distance (some 10-12nm in good visibility). Guidelines (applicable to both existing and new offshore installations) aimed at reducing the impact of offshore installations lighting on birds in the OSPAR maritime area are available (OSPAR 2015). Exploration drilling activities are temporary so a drilling rig will be present at a location for a relatively short period, limiting the potential for significant interaction with migratory bird populations. It is therefore concluded that light effects will not have a significant effect on sites with qualifying mobile species which could potentially interact with illuminated drilling rigs and vessels.

The presence and/or movement of vessels from and within Blocks during drilling activities could also potentially disturb marine mammals foraging within or close to designated or potential SACs for which they are a qualifying feature. However, shore-based monitoring of the effects of boat activity on the behaviour of bottlenose dolphins off the US South Carolina coast, indicated that slow moving, large vessels, like ships or ferries, appeared to cause little to no obvious response in dolphin groups (Mattson *et al.* 2005). Pirotta *et al.* (2015) used passive acoustic techniques to quantify how boat disturbance affected bottlenose dolphin foraging activity in the inner Moray Firth. The presence of moving motorised boats appeared to affect bottlenose dolphin buzzing activity (foraging vocalisations), with boat passages corresponding to a reduction by almost half in the probability of recording a buzz. The boat effect was limited to the time where a boat was physically present in the sampled area and visual observations indicated that the effect increased for increasing numbers of boats in the area (Pirotta *et al*. 2013). Dolphins appeared to temporarily interrupt their activity when disturbed, staying in the area and quickly resuming foraging as the boat moved away. Repeated disruptions of foraging activity have the potential to translate into reduced energy intake (New *et al.* 2013). New *et al*. (2013) developed a mathematical model to simulate the complex social, spatial, behavioural and motivational interactions of coastal bottlenose dolphins (*Tursiops truncatus*) in the Moray

Firth, in order to assess the biological significance of increased rate of behavioural disruptions caused by vessel traffic. They explored a scenario in which vessel traffic increased from 70 to 470 vessels a year in response to the construction of a proposed offshore renewables facility. Despite the more than six-fold increase in vessel traffic, the dolphins' predicted behavioural time budget, spatial distribution, motivations and social structure remained unchanged.

Worldwide, collisions with vessels are a potential source of mortality to marine mammals, primarily cetaceans. Whales are occasionally reported to be struck and killed, especially by fast-moving ferries but smaller cetacean species can also be impacted by propeller strikes from smaller vessels. In the UK certain areas experience very high densities of commercial and recreational shipping traffic, some of which may also be frequented by large numbers of marine mammals; despite this, relatively few deaths are recorded as results of collisions (Hammond *et al*. 2008). Between 2000 and 2009, only 11 out of 1,100 post-mortems on harbour porpoises and common dolphins identified collision as the cause of death (UKMMAS 2010).

4.3.4 Screening criteria for physical and drilling effects

With respect to **physical and drilling effects**, any Block should be screened in that is within or impinges on a Natura 2000 site, together with any Block within a buffer of 10km from a Natura 2000 site where there is a potential interaction between site features and exploration/appraisal activities in the Block.

Blocks screened in on the basis of physical and drilling effects and the relevant Natura 2000 sites are shown in Figures 5.1 (SPAs) and 5.2 (SACs) and listed in Appendix B2.

4.4 Underwater noise

4.4.1 Noise sources and propagation

The sources, measurement, propagation, ecological effects and potential mitigation of noise associated with hydrocarbon exploration and production have been extensively reviewed, assessed and updated in each of the successive offshore energy SEAs (see DECC 2009, 2011, 2016).

Of those activities which could follow licensing (Table 2.2), geological seismic survey is of primary concern for noise effects. Other noise levels associated with activities potentially resulting from licensing of Blocks such as rig site survey, Vertical Seismic Profiling (VSP), drilling and vessel movements, are of a considerably lower magnitude and duration than those resulting from a deep geological seismic survey. There is now a reasonable body of evidence to quantify noise levels associated with these activities and to understand the likely propagation of such noise within the marine environment, even in more complex coastal locations.

4.4.2 Effects thresholds

Potential effects of anthropogenic noise on receptor organisms range widely, from masking of biological communication and small behavioural reactions, to chronic disturbance, auditory injury and mortality. In addition to direct effects, indirect effects may also occur for example via effects on prey species, complicating the overall assessment of significant effects. Marine mammals, and in particular the harbour porpoise, are regarded as the most sensitive to acoustic disturbance therefore it is considered appropriate to focus on marine mammals when assessing risk from underwater noise. While generally the severity of effects tends to increase with increasing exposure to noise, it is important to draw a distinction between effects associated with physical (including auditory) injury and effects associated with behavioural disturbance.

With respect to injury, risk from an activity can be assessed using threshold criteria based on sound levels. The latest SEA (OESEA3) supports the application of injury thresholds criteria developed by Southall *et al.* (2007), including the subsequent update for harbour porpoises in Lepper *et al*. (2014), based on the work by Lucke *et al.* (2009). It is recognised that seismic surveys have the potential to generate sound that exceeds thresholds of injury, but only within a limited range from source (tens to hundreds of meters). Within this zone, current mitigation measures as described in JNCC guidelines are thought sufficient in minimising the risk of injury to negligible levels.

With respect to disturbance however, it has proved much more difficult to establish broadly applicable threshold criteria based on exposure alone; this is largely due to the inherent complexity of animal behaviour where the same sound level is likely to elicit different responses depending on an individual's behavioural context and exposure history. Field observations during industrial activities are fundamental sources of information for assessment. There is evidence for several species of cetaceans (mainly baleen whales) to suggest avoidance over distances most commonly around 2-5km from the seismic source while changes in acoustic communication have been recorded at much greater distances (up to tens or hundreds of kilometres) but the biological significance of these observed changes is uncertain. Evidence of the effects of seismic surveys on odontocetes and pinnipeds is limited but of note are the recent studies carried out in the Moray Firth observing responses to a 10 day 2-D seismic survey (Thompson *et al.* 2013a). Thompson *et al*. (2013a) reported a relative decrease in the density of harbour porpoises within 10km of the survey vessel and a relative increase in numbers at distances greater than 10km. These effects were short-lived with porpoise returning to impacted areas within 19 hours after cessation of activities. Overall it was concluded that while short-term disturbance was induced, the survey did not lead to long-term or broad-scale displacement (Thompson *et al*. 2013a). Further acoustic analyses revealed that for those animals which stayed in proximity to the survey, there was a 15% reduction in buzzing activity associated with foraging or social activity; however, high levels of natural variability in the detection of buzzes was noted prior to survey (Pirotta *et al*. 2015). Passive acoustic monitoring provided evidence of short-term behavioural responses also for bottlenose dolphins but no measurable effect on the number of dolphins using the Moray Forth SAC could be revealed (Thompson *et al*. 2013b).

Many species of fish are highly sensitive to sound and vibration and broadly applicable sound exposure criteria have recently been published (Popper *et al.* 2014). Studies investigating fish mortality and organ damage from noise generated during seismic surveys are very limited and results are highly variable, from no effect to long-term auditory damage (reviewed in Popper *et al.* 2014). On the other hand, behavioural responses and effects on fishing success ("catchability") have been reported following seismic surveys (Pearson *et al.* 1992, Skalski *et al.* 1992, Engås *et al.* 1996, Wardle *et al*. 2001). Potential effects on migratory diadromous fish is an area of significant interest for which empirical evidence is still limited, especially as salmonids and eels are sensitive to particle motion (not sound pressure) (Gill & Bartlett 2010). Atlantic salmon *Salmo salar* have been shown through physiological studies to respond to low frequency sounds (below 380Hz), with best hearing at 160Hz (threshold 95 dB re 1 µPa). Hence, their ability to respond to sound pressure is regarded as relatively poor with a narrow frequency span, a limited ability to discriminate between sounds, and a low overall sensitivity (Hawkins & Johnstone 1978, cited by Gill & Bartlett 2010).

Direct effects from seismic exploration noise on seabirds could occur through physical damage, or through disturbance of normal behaviour. Diving seabirds (e.g. auks) may be most at risk of acute trauma but while this is theoretically possible, evidence is limited. Hearing sensitivity for species measured so far peaks between 1 and 3kHz, with a steep roll-off after 4kHz (Crowell e*t al.* 2015). Mortality of seabirds has not been observed during extensive seismic operations in the North Sea and elsewhere. A study investigated seabird abundance in Hudson Strait (Atlantic seaboard of Canada) during seismic surveys over three years (Stemp 1985). Comparing periods of shooting and non-shooting, no significant difference was observed in abundance of fulmar, kittiwake and thick-billed murre (Brünnich's guillemot).

Airborne noise, for example from helicopter overflights, could potentially disturb birds in coastal SPAs, although in the context of other military and civilian aircraft activities the anticipated level of Block activity related noise is considered insignificant.

4.4.3 Screening criteria for underwater noise effects

With respect to **acoustic disturbance**, any Block should be screened in that is within 15km of a SAC with qualifying features regarded as sensitive to underwater noise (e.g. marine mammals and migratory fish). In the context of established injury threshold criteria (e.g. Southall *et al.* 2007), and the outcome of studies on the effects of seismic activity on marine mammal species in the UKCS (e.g. Thompson *et al.* 2013a, Pirotta *et al.* 2013), this is considered to be a conservative estimate of a maximum distance within which likely significant effects could be expected from the loudest noise sources associated with geological seismic survey activities. Blocks within 15km of an SPA designated for deep diving birds (e.g. auks, gannets) should also be screened in.

Blocks screened in on the basis of acoustic disturbance effects and the relevant Natura 2000 sites are shown in Figures 5.3 (SPAs) and 5.4 (SACs) and listed in Appendix B3.

4.5 Consideration of mobile species

There is the potential for mobile species (primarily seabirds, marine mammals and fish which are qualifying species of relevant sites) to interact with exploration and appraisal activities which could occur in 29th Round Blocks, outside of Natura 2000 sites. An overview of the current understanding of the foraging ranges of relevant species and therefore their potential interaction with work programme activities at distance from relevant sites is given below.

4.5.1 Seabirds

Information on the foraging movements of a number of seabird species has increased in recent years, mainly due to advances in satellite and other tracking technologies (e.g. Langston *et al*. 2013, Wakefield *et al*. 2015, Thaxter *et al*. 2014, Cleasby *et al*. 2015). There is generally limited information on foraging areas used by species from particular colonies, and to help address this, Thaxter *et al*. (2012) reported on representative breeding season foraging ranges for a range of species.

Table 4.2 provides indicative foraging ranges (mean maximum and mean) travelled for a range of seabird species from a breeding colony to a foraging area. The mean maximum foraging range value has been used here to show possible connectivity to breeding colony SPAs, however bird density will not be continuous throughout this range. Other ways of representing foraging ranges (e.g. the mean, or percentage foraging area derived from kernel analyses) may therefore provide more useful information, where available. Caution is also required when using limited foraging range data, for example the use of a single breeding season or location, relatively small sample size, and lack of direct studies to provide ‘‘representative’’ foraging range information (Thaxter *et al*. 2012).

Table 4.2: Indicative breeding season foraging ranges

Species	Mean maximum[1] (km)	Mean[2] (km)	Confidence level[3]
Eider	80	2.4	Poor
Red-throated diver	9	4.5	Low
Fulmar	400 ± 245.8	47.5 ± 1	Moderate
Manx shearwater	18.3 ± 12.5 & >330	2.3 ±0.8	Moderate
Leach’s storm petrel	91.7 ± 27.5	-	Poor
Gannet	229.4 ± 124.3	92.5 ± 59.9	Highest
Cormorant	25 ± 10	5.2 ± 1.5	Moderate
Shag	14.5 ± 3.5	5.9 ± 4.7	Moderate
Arctic skua	62.5 ± 17.2	6.4 ± 5.9	Uncertain
Great skua	10.9 ± 3.0 & 86.4	-	Moderate, Poor
Black-headed gull	25.5 ± 20.5	11.4 ± 6.7	Uncertain
Common gull	50	25	Poor
Mediterranean gull	20	11.5	Uncertain
Herring gull	61.1 ± 44	10.5	Moderate
Lesser black-backed gull	141.0 ± 50.8	71.9 ± 10.2	Moderate
Kittiwake	60.0 ± 23.3	24.8 ±12.1	Highest
Sandwich tern	49.0 ± 7.1	11.5 ± 4.7	Moderate
Roseate tern	16.6 ± 11.6	12.2 ± 12.1	Low

Species	Mean maximum[1] (km)	Mean[2] (km)	Confidence level[3]
Common tern	15.2 ± 11.2	4.5 ± 3.2	Moderate
Arctic tern	24.2 ± 6.3	7.1 ± 2.2	Moderate
Little tern	6.3 ± 2.4	2.1	Low
Guillemot	84.2 ± 50.1	37.8 ± 32.2	Highest
Razorbill	48.5 ± 35.0	23.7 ± 7.5	Moderate
Puffin	105.4 ± 46.0	4	Low

Note:

1. The maximum range reported in each study averaged across studies.

2. The mean foraging range reported for each colony averaged across all colonies. For tracking studies, this was typically the mean foraging range from all central place foraging trips assessed at the colony.

3. Confidence levels were assigned as follows: highest (based on >5 direct studies); moderate (between 2-5 direct studies); low (1 direct study); uncertain (foraging range estimated using (few) survey data).

Source: Thaxter et al. (2012)

The offshore distribution of the above species varies throughout the year but in general they are widely distributed at low densities with areas of moderate or higher density. Within the North Sea, these areas include the shelf edge for gannet and lesser black-backed gulls, the Dogger Bank for guillemot, the Dutch Bank for herring gull, Fladen Ground for kittiwake, the Moray Firth and Aberdeen bank for razorbill (Stone *et al*. 1995). To the north west of the UK, seabird distribution is closely correlated to water depth with more birds found over shallower continental shelves than the deeper oceanic waters. Birds present in the deeper slope and oceanic waters will comprise mainly pelagic species (e.g. fulmar, gannet and kittiwake). Some high density areas are also likely to be transitory, associated with short-lived natural feeding aggregations or attraction to fishing vessels. A BEIS-funded three year telemetry study of gannets from Bempton Cliffs indicated a marked decline in the density of foraging locations with distance from colony which was the over-riding influence on gannet distribution at sea during the breeding season (Langston *et al*. 2013). Similarly Witt *et al*. (2012) reported that breeding birds, constrained to return to the nest, foraged less widely than immature birds; and other studies using GPS tracking of breeding gannets have indicated some consistency in the use of foraging areas by individual adults (e.g. Hamer *et al*. 2007, Patrick *et al*. 2015, Wakefield *et al*. 2015).

As part of the process of identifying potential Marine Protected Areas, seabird aggregations have been delineated through analysis of the European Seabirds at Sea (ESAS) database (Kober *et al.* 2010, 2012). Forty-two areas were identified for eleven seabird species, covering many of the species highlighted in Table 4.2 (fulmar, Manx shearwater, gannet, shag, great skua, kittiwake, common gull, herring gull, Arctic tern, guillemot and puffin) in both the breeding and the non-breeding seasons. A review of 25 of these areas in light of other independent information was carried out to provide a more robust and complete evidence-base on which to base any future decisions about these areas (note that a number are currently proposed SPAs) (Cook *et al.* 2015). The review also considered whether there was a sound ecological rationale behind each aggregation such as the presence of suitable habitat, proximity to known breeding colonies, or high abundance of prey species in the area. Based on this process, a number of proposed marine SPAs have recently or are currently undergoing consultation which

cover foraging areas during breeding periods as well as wintering areas for most of the species identified above. These proposed SPAs have been screened in where appropriate. BEIS will ensure that the HRA process considers the ongoing marine SPAs identification process.

Physical, visual or acoustic disturbance from exploration drilling and seismic survey is not regarded to result in significant effects for bird species in relation to Blocks beyond those already screened in, as outlined in Sections 4.3 and 4.4. This is due to: the relatively small seabed footprint and transitory nature of rig placement/installation and drilling discharges coupled with the relatively low densities of seabirds in offshore waters; that none of the species identified are particularly vulnerable to disturbance by shipping (Garthe & Hüppop 2004) and are therefore unlikely to be significantly disturbed by the presence and movement of vessels associated with exploration activities; the likely low density of gannets, razorbill and guillemots in offshore areas (outside Blocks screened in by the 15km noise criterion), and limited exposure time during foraging dives to underwater noise associated with seismic survey.

4.5.2 Marine mammals

Grey seal telemetry data from 1991-2011 and harbour seal telemetry data from 2001-2012 have been used to produce UK-wide maps by species of estimated density (Jones *et al*. 2015). Figures 5.5 and 5.6 show the UK wide density of harbour and grey seals respectively in relation to the 29th Round Blocks offered, those Blocks screened in and relevant seal management units. The usage maps represent the estimated density of the expected population of seals in each 5x5km grid square at any point in time (Jones *et al*. 2015).

The seal management units (MU) currently in use around the UK (indicated on Figures 5.5 and 5.6) were originally formulated in response to requirements of legislative drivers and do not define discrete populations. Given the movement of animals between MUs (Russell *et al*. 2013), especially in the case of grey seals, impacts on animals may have effects at the population level outside the particular MU with which the 'population' is associated (SCOS 2014). For harbour seals, these are broadly similar to OSPAR EcoQO units (OSPAR Ecological Quality Objectives) and supported by recent ICES advice on assessment units for the Marine Strategy Framework Directive (MSFD) (ICES 2014). For grey seals, ICES has advised for only two assessment units, one for the North Sea and one to combine western Britain, Ireland and Western France. An Inter-Agency Marine Mammal Working Group (IAMMWG 2015) paper on management units for cetaceans in UK waters indicated that an as yet unpublished paper outlining seal MUs was in preparation. The areas of highest seal density are primarily associated with nearshore waters close to colonies, some of which are designated SACs. Relevant 29th Round Blocks in these areas have already been screened in.

Analyses of photo-identification data and some genetic studies have shown that within European waters there are coastal/inshore groups of bottlenose dolphins which are mobile and range over large areas but still show strong site fidelity along defined stretches of coast (see ICES 2013, Quick *et al*. 2014). Some dolphins appear to make long-distance movements from the east coast of Scotland to the west coast of Scotland and to Irish waters, although the population identity of these apparently wide-ranging individuals is unknown (Robinson *et al*. 2012). Whilst ICES (2013) recognised that in some areas information is incomplete, that distribution may be ephemeral and the animals present likely comprise sympatric populations,

they proposed a series of bottlenose dolphin MU for UK waters; the boundaries of which were finalised by IAMMWG (2015) (Figure 5.9). Figure 5.7 shows that all 29th Round Blocks within the coastal east Scotland MU for bottlenose dolphin, which may be associated with the Moray Firth SAC, have already been screened in (see Section 4.5.4).

The harbour porpoise is the most common cetacean in UK waters; it is wide-ranging and abundant throughout the UK shelf seas, both coastally and offshore (Reid *et al*. 2003). This species is sighted throughout the year, although peak numbers are generally recorded in summer months from June to October. Since the early 1990s it appears to have become much less common around the Northern Isles, while increasing in numbers in the English Channel, southern North Sea and in the Celtic Sea, where few individuals had been previously observed (i.e. SCANS-I 1994) (Hammond *et al*. 2013, also see Evans *et al.* 2015). In coastal waters they are often encountered close to islands and headlands with strong tidal currents (e.g. Pierpoint 2008); sightings becoming increasingly rare close to the continental shelf edge, with relatively few records in deeper waters beyond the shelf edge (Reid *et al*. 2003). Individuals across the UKCS are part of the north east Atlantic population which is mainly considered to be a single 'continuous' population, even though some degree of genetic differentiation has been observed (Andersen *et al.* 1997, 2001, Tolley *et al.* 2001, Fontaine *et al.* 2007). However, for management and conservation purposes, three distinct UK Management Units have been proposed (IAMMWG 2015); the North Sea, West Scotland and the Celtic & Irish Seas.

Heinänen & Skov (2015) identified discrete and persistent areas of relatively high porpoise density, mainly within the Irish Sea and Welsh coastal waters, shelf waters of the North Sea and along the north-west Scottish coast. Following on from this work, six proposed Special Areas of Conservation (pSACs) (in both inshore and offshore waters) were identified for harbour porpoise and are currently being considered, with the Inner Hebrides and The Minches cSAC having been submitted to the European Commission in September 2016. The Southern North Sea pSAC is the only site screened in with respect to the 29th Round Blocks.

4.5.3 Fish

Of those fish listed under Annex II of the EC Habitats Directive, only Atlantic salmon, sea lamprey and river lamprey are qualifying species of sites relevant to the 29th Round Blocks.

Given their widespread and transient presence offshore, particularly in the majority of Blocks to the west of the UK in deeper waters, where diadromous species for example will only be present on migration and unlikely to be encountered, potential exploration activity in the 29th Round Blocks away from the coast is unlikely to have a significant effect on relevant sites. Consequently, no additional Blocks to those already screened in on the basis of physical disturbance or noise effects have been identified for further assessment.

4.5.4 Conclusion

Whilst individuals of the mobile species discussed above could potentially interact with work programme activities associated with the Initial Term (see Section 2.2) for Blocks other than those already screened in, significant effects on the populations of sites relating to such

species, and therefore the conservation status of such sites, are not considered likely. This is due to the combination of:

- The small physical footprint of activities and their transitory nature.
- The likely scale of potential activity (i.e. number of licences applied for and awarded, and actual activity which follows, see Section 2.3.1), and the duration of the initial term (up to 9 years) within which activity could take place.
- The likely relative density of relevant features in relation to activities which could take place.

4.6 In-combination effects

This screening assessment includes the potential for in-combination effects leading to likely significant effects on European sites resulting from the interaction of exploration/appraisal activities in 29th Round Blocks with activities resulting from other marine plans, programmes and activities.

Marine planning has a key role in informing strategic and project level spatial considerations, with the Marine Policy Statement indicating, *"Marine Plans should reflect and address, so far as possible, the range of activities occurring in, and placing demands on, the plan area. The Marine Plan should identify areas of constraint and locations where a range of activities may be accommodated. This will reduce real and potential conflict, maximise compatibility between marine activities and encourage co-existence of multiple uses."*

Currently, there are 11 marine plan areas within English inshore and English offshore regions and marine plans have been prepared for two of these, the East Inshore and Offshore plans. The North East marine plan is in development. The Scottish National Marine Plan was adopted in March 2015 and subsequent regional planning has been proposed for a further 11 inshore areas. Other devolved plans are still in development. To date, whilst the marine plans acknowledge the potential interactions between activities and map these, they are not spatially prescriptive and therefore provide a limited indication of the location of possible future development.

The uncertainty over the scale and timing of activities which could follow licensing of 29th Round Blocks and the activities resulting from other plans and programmes is recognised. Using a GIS, the 29th Round Blocks (distinguishing those screened in and screened out following the application of the criteria given in Section 4.3-4.5) are considered in the context of areas of activity and proposals for a range of marine activities/potential activities including:

- Existing oil and gas licences (Figures 5.8 and 5.9)
- Carbon Capture and Storage Agreement for Leases (Figures 5.8 and 5.9)
- Existing oil and gas infrastructure (Figures 5.10 and 5.11)

- Marine renewable energy developments and zones (Figures 5.12 and 5.13)
- Navigation density (Figures 5.14 and 5.15)

GIS outputs are included for each of the above showing the spatial relationship to SPAs and SACs and a text based consideration is made of the potential for in-combination effects leading to likely significant effects on European sites (see Section 5).

5 Screening

5.1 Screening of potential effects of 29th Round Block activities

The screening of the various sources of impact from exploration and appraisal activities which could follow licensing of the 29th Round Blocks (as described in Section 4) were applied to the relevant European sites and considered in the context of mobile species when not within site boundaries. This led to the identification of a number of Blocks for which likely significant effects on European sites could not be discounted at the screening stage. Figures 5.1-5.4 illustrate these initial screening results as paired maps showing the Blocks and sites which have been screened in.

The Blocks screened in at this stage are listed in Table 5.1.

Table 5.1: List of Blocks initially screened in

West of Scotland									
128/1	134/11	138/8	139/18	141/6	148/24	153/22	155/15	164/9	166/22
128/2	134/12	138/9	139/21	141/7	148/25	153/23	155/16	164/10	166/23
128/3	134/13	138/10	139/22	141/8	148/26	153/24	155/17	164/11	166/24
128/4	134/14	138/13	139/26	141/11	148/27	153/25	155/18	164/12	166/25
128/5	134/16	138/14	139/27	141/12	148/28	153/29	155/19	164/13	166/26
128/6	134/17	138/15	140/7	141/13	148/29	153/30	155/21	164/14	166/27
128/7	134/18	138/19	140/8	141/16	148/30	154/16	155/22	164/15	166/28
128/8	134/19	138/20	140/9	141/17	149/21	154/17	156/1	165/1	166/29
128/9	134/20	138/23	140/10	141/18	149/26	154/18	156/2	165/2	166/30
128/10	134/21	138/24	140/12	141/19	149/27	154/19	156/3	165/3	174/27
129/1	134/22	138/25	140/13	141/21	152/15	154/21	156/4	165/4	174/28
133/14	134/23	138/27	140/14	141/22	152/19	154/22	156/5	165/6	174/29
133/15	134/24	138/28	140/15	141/23	152/20	154/23	156/8	165/7	174/30
133/18	134/25	138/29	140/17	141/26	153/11	154/24	156/9	165/8	175/21
133/19	134/26	138/30	140/18	141/27	153/12	154/25	156/10	165/9	175/22
133/20	134/27	139/1	140/19	148/6	153/13	154/26	156/14	165/10	175/26
133/23	134/28	139/2	140/20	148/11	153/14	154/27	156/15	165/11	175/27
133/24	138/1	139/6	140/22	148/16	153/15	154/28	164/2	165/12	175/28
133/25	138/2	139/7	140/23	148/17	153/16	154/29	164/3	165/24	
133/29	138/3	139/11	140/24	148/18	153/17	154/30	164/4	165/25	
133/30	138/4	139/12	140/25	148/19	153/18	155/4	164/5	165/29	
134/6	138/5	139/13	140/28	148/21	153/19	155/5	164/6	165/30	
134/7	138/6	139/16	140/29	148/22	153/20	155/13	164/7	166/6	
134/8	138/7	139/17	140/30	148/23	153/21	155/14	164/8	166/21	
Northern North Sea									
16/2a									

Table 5.1: List of Blocks initially screened in

Mid North Sea High									
18/30	25/5	26/1	34/3	34/25	37/12	37/28b	38/28	42/9a	44/5
19/11	25/8	26/6	34/4	36/13	37/13	37/29b	38/29	42/10c	45/1
19/12	25/9	26/16	34/6	36/14	37/16	37/30	38/30	42/13b	
19/13	25/10	26/17	34/7	36/15	37/17	38/16	39/12	42/14a	
19/16	25/13	26/21	34/8	36/18	37/18	38/17	39/17	42/17	
19/17	25/14	26/22	34/9	36/19	37/19	38/21	39/21	42/26	
19/18	25/18	26/23	34/12	36/20	37/20	38/22	39/26	42/27b	
19/21	25/19	26/26	34/13	36/23	37/21	38/23	40/5	43/10	
19/22	25/20	26/27	34/14	36/24	37/22	38/24	41/29a	44/1	
19/23	25/24	26/28	34/15	36/25	37/23	38/25	41/29b	44/2	
19/26	25/25	34/1	34/17	36/29	37/24	38/26	41/30	44/3	
25/4	25/30	34/2	34/20	37/11	37/25	38/27	42/8a	44/4	

5.2 Screening for potential in-combination effects

The Blocks identified (Table 5.1) for further assessment were considered further in terms of the potential for likely significant effects to arise from activities in 29th Round Blocks, in-combination with those from other marine activities. Relevant marine activities were identified based on those referred to in Appendix 1h of OESEA3 (DECC 2016) and where it was considered that a relevant pathway of in-combination effect was present. The sources of in-combination effect are regarded to be largely related to physical disturbance and noise, and in the context of those areas being offered for licensing, any such effects are expected to be primarily from other offshore energy, specifically offshore wind in the Mid North Sea High area and existing oil and gas activity in the northern North Sea area. Aggregate extraction is not presently undertaken within any of the three 29th Seaward Licensing Round areas.

Figures 5.8 and 5.9 illustrate the spatial relationship between existing oil and gas licences, agreements for lease (AfL) for carbon capture and storage and the relevant European sites, as well as the 29th Round Blocks (with those screened in identified). Existing controls on exploration and appraisal operations, and their likely intensity, suggest that significant in-combination effects of existing licensed areas and those proposed for licensing in the 29th Seaward Licensing Round on European sites are not likely. Carbon capture and storage AfLs can overlap with oil and gas licence Blocks but the two currently granted (for the Goldeneye field in Blocks 14/29a, 20/4b and 20/3b, and National Grid's 5/42 site in the southern North Sea in a number of Blocks in Quadrants 42 and 43) are either remote from any European sites and propose to use either existing (Goldeneye) or relatively small, new unmanned facilities (National Grid). Should either development progress, in-combination effects are not considered likely.

Figures 5.10 and 5.11 illustrate existing oil and gas infrastructure, relevant European sites and the 29th Round Blocks. Based on the lack of or limited spatial overlap, documented scale of effects from production operations together with existing controls on exploration and appraisal

operations, significant in-combination effects on European sites are not likely to occur because of the application of existing controls and mandatory assessments.

Figures 5.12 and 5.13 show marine renewable energy development and development zones, relevant European sites and the 29th Round Blocks. A number of Blocks overlap with renewable energy developments, with a number also coinciding with European sites (specifically Blocks overlap with the Dogger Bank SAC and Southern North Sea pSAC, and the Creyke Beck/Teesside wind farm developments, and the Outer Firth of Forth and St Andrews Bay Complex pSPA and the Neart na Gaoithe and Inch Cape wind farm developments (recently put on hold following a judicial review[25])). In all cases these Blocks have been screened in to the second stage of HRA when the potential for significant in-combination effects on European sites would be assessed.

Figures 5.14 and 5.15 illustrate the spatial relationship between the density of navigation use of UK waters, relevant European sites and the 29th Round Blocks. The 29th Round Blocks coincident with areas of elevated navigation density in or in proximity to European sites (where potential significant in-combination effects could occur) have been screened in to the second stage of HRA where this consideration will be made.

Commercial fishing occurs throughout UK waters and effort data provides a strategic level proxy of fisheries activity across the UKCS. However, it is noted that activity is seasonally and annually variable, and collated data includes most but not all fishing activity. Fishing and particularly bottom trawling has historically contributed to seabed disturbance over extensive areas, and was identified as an ongoing problem in the UK initial assessment for MSFD[26]. It was also noted that depending on the nature of future measures (e.g. in relation to MPA management in the wider environment and within MPAs), such effects are likely to be reduced and therefore some improvement in benthic habitats could be expected. In England such management is coordinated between the Inshore Fisheries and Conservation Authorities and the Marine Management Organisation for sites within 12nm, and by Scottish Ministers in Scottish waters. For offshore sites, measures are required to be proposed by the European Commission in accordance with the Common Fisheries Policy[27]. A revised approach to the management of commercial fisheries in European sites[28] has sought to implement steps to ensure that they are managed in accordance with Article 6 of the Habitats Directive, and a number of closure areas are either already in place or have been proposed. Such closures may limit the potential for in-combination effects, particularly when considered in addition to mitigation which is available to reduce or avoid effects on sites from exploration activity.

[25] http://www.scottishlegal.com/2016/07/21/rspb-wins-legal-challenge-to-put-offshore-wind-farms-on-hold/
[26] https://www.gov.uk/government/publications/marine-strategy-part-one-uk-initial-assessment-and-good-environmental-status
[27] Also refer to Regulation (EU) No. 1380/2013 on the Common Fisheries Policy.
[28] https://www.gov.uk/government/publications/revised-approach-to-the-management-of-commercial-fisheries-in-european-marine-sites-overarching-policy-and-delivery also see: http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/SACmanagement

Figure 5.1: Physical and drilling effects – Blocks screened in, showing SPAs

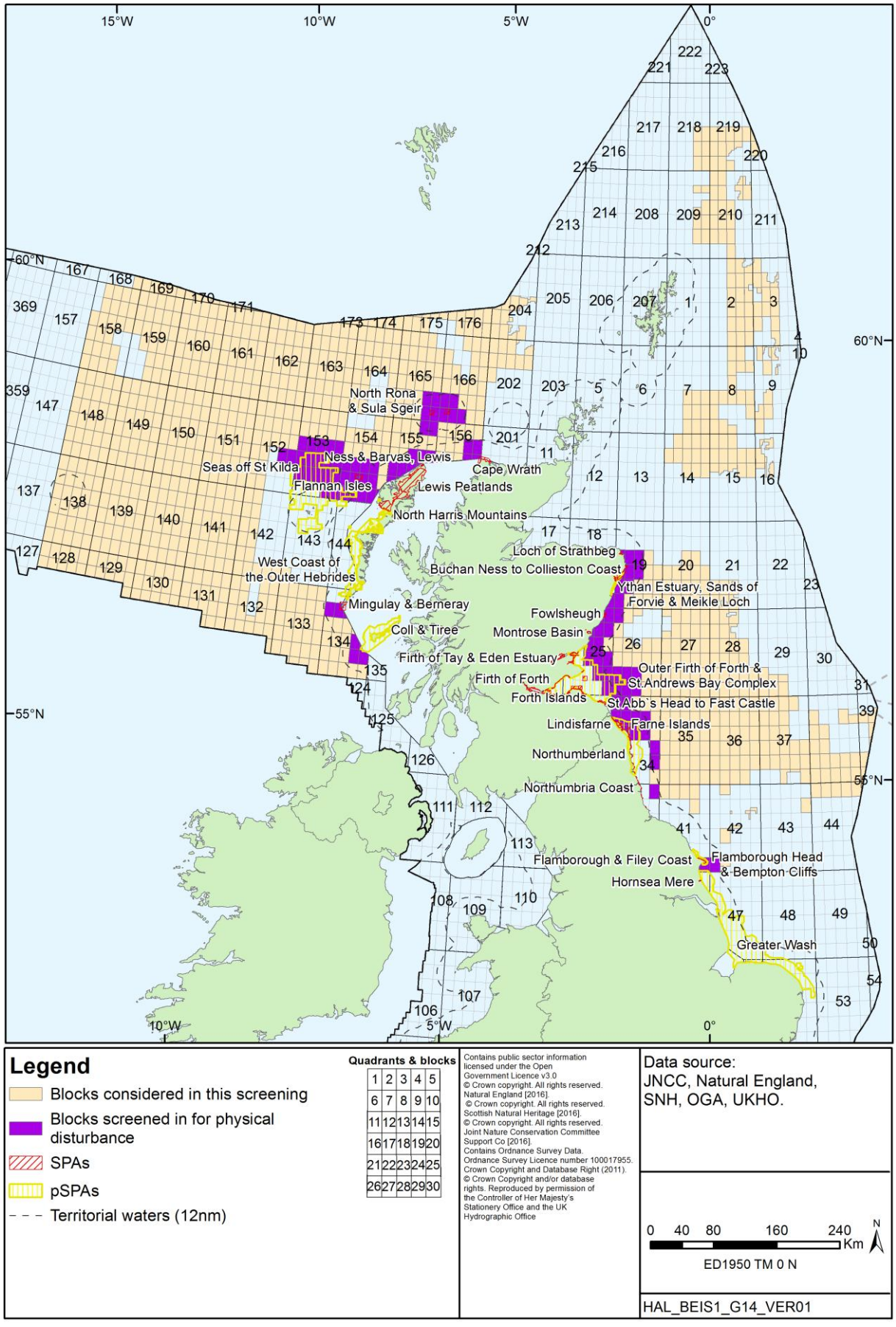


Figure 5.2: Physical and drilling effects – Blocks screened in, showing SACs

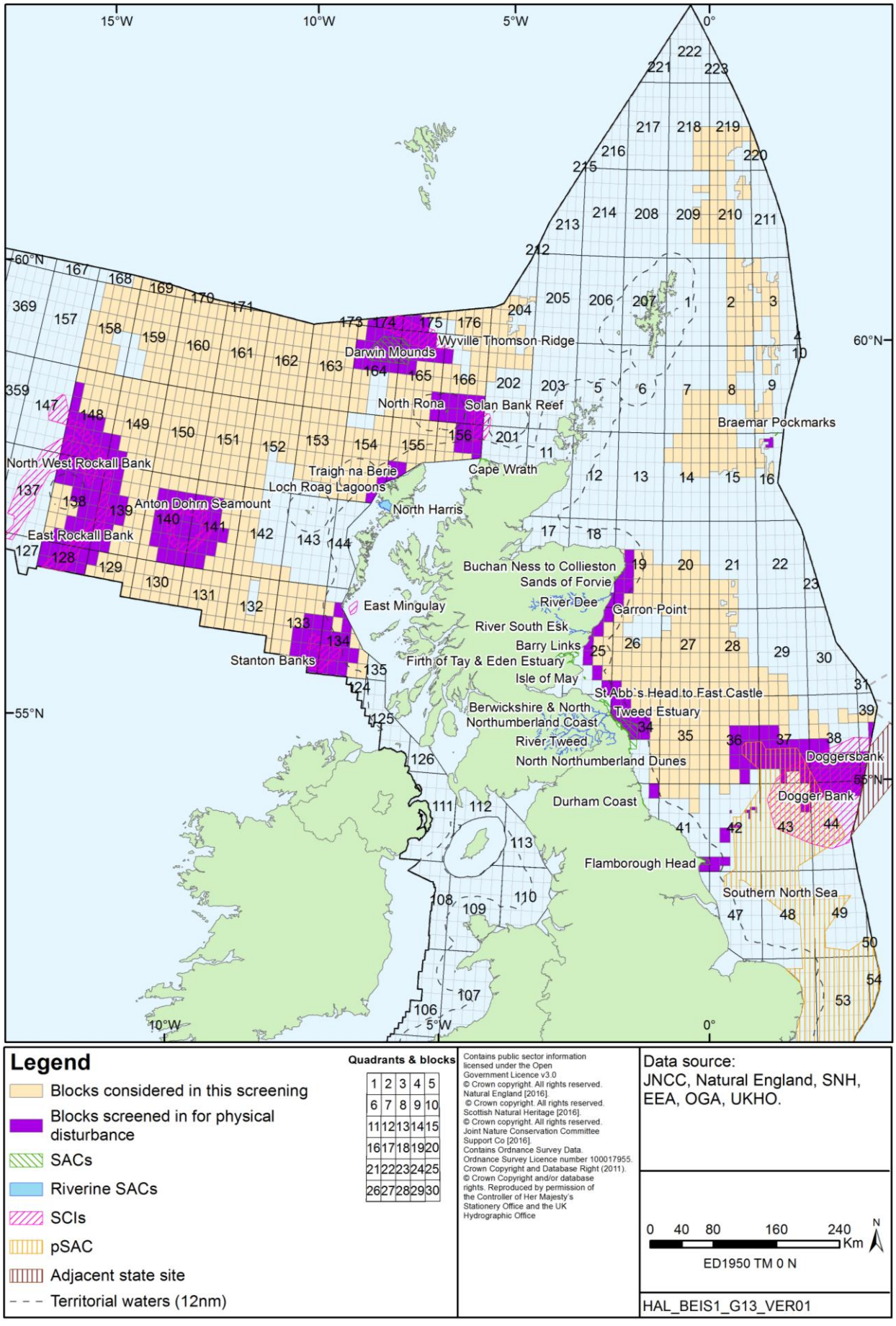


Figure 5.3: Acoustic disturbance effects – Blocks screened in, showing SPAs

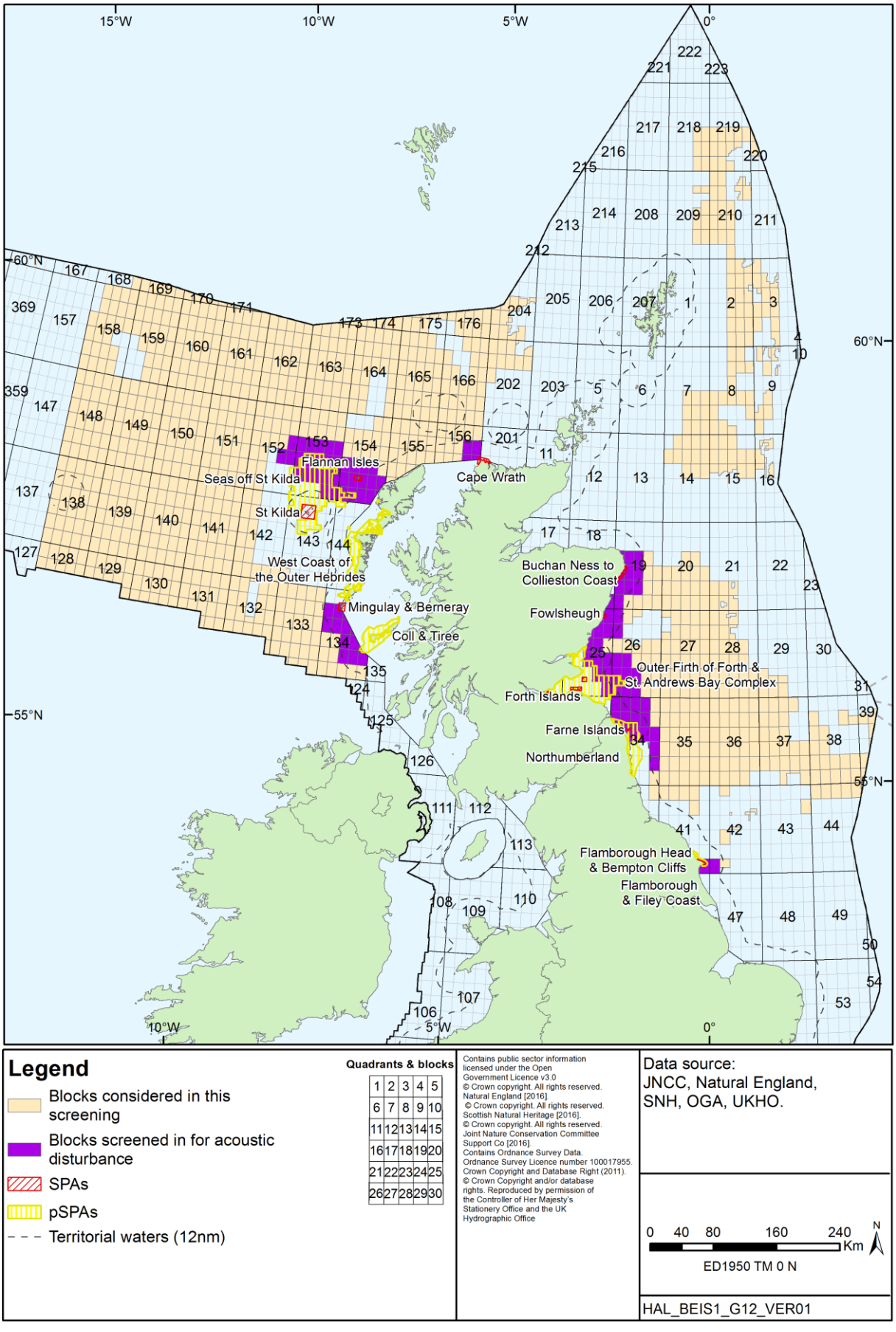


Figure 5.4: Acoustic disturbance effects – Blocks screened in, showing SACs

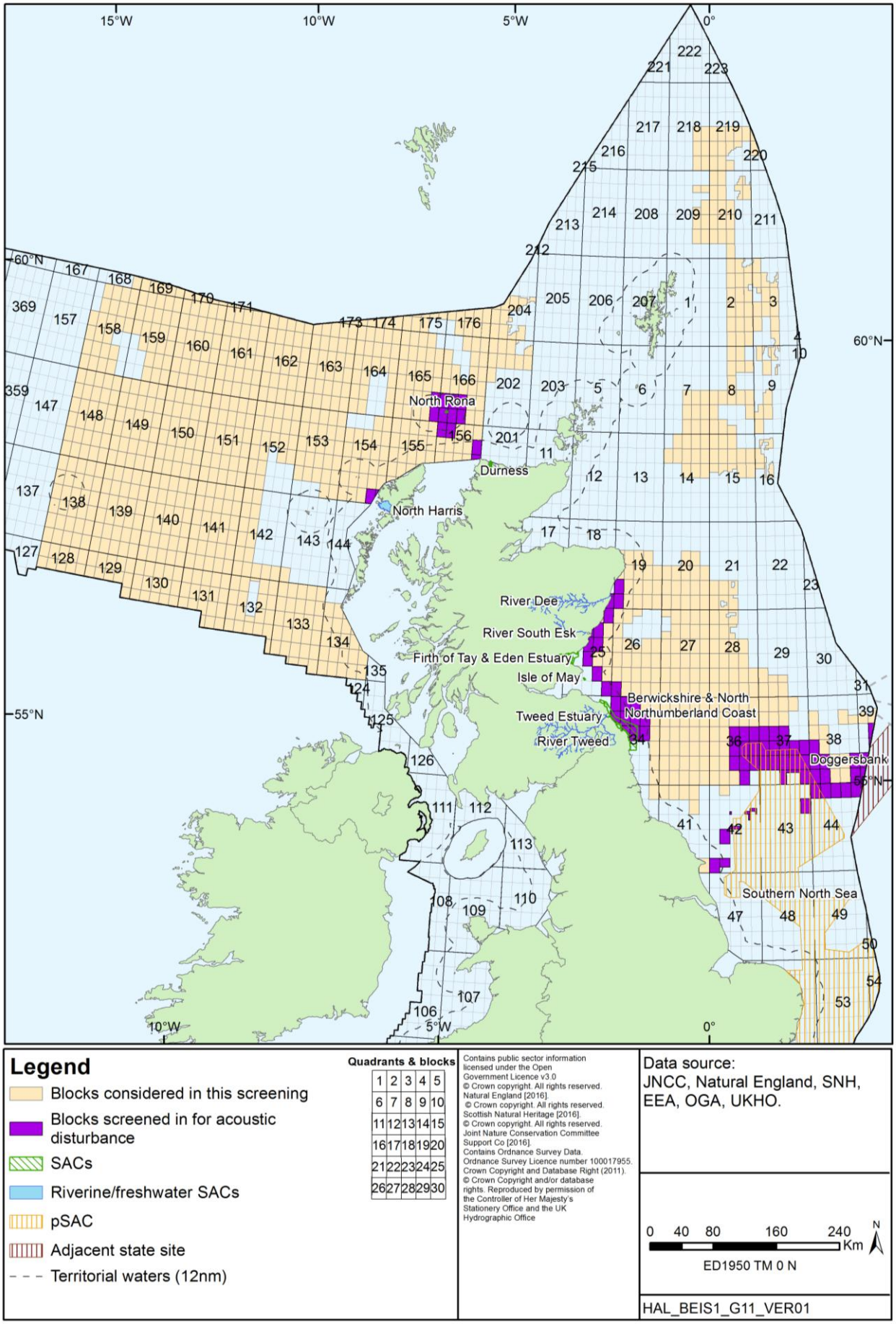


Figure 5.5: Estimated total density of harbour seals in UK waters

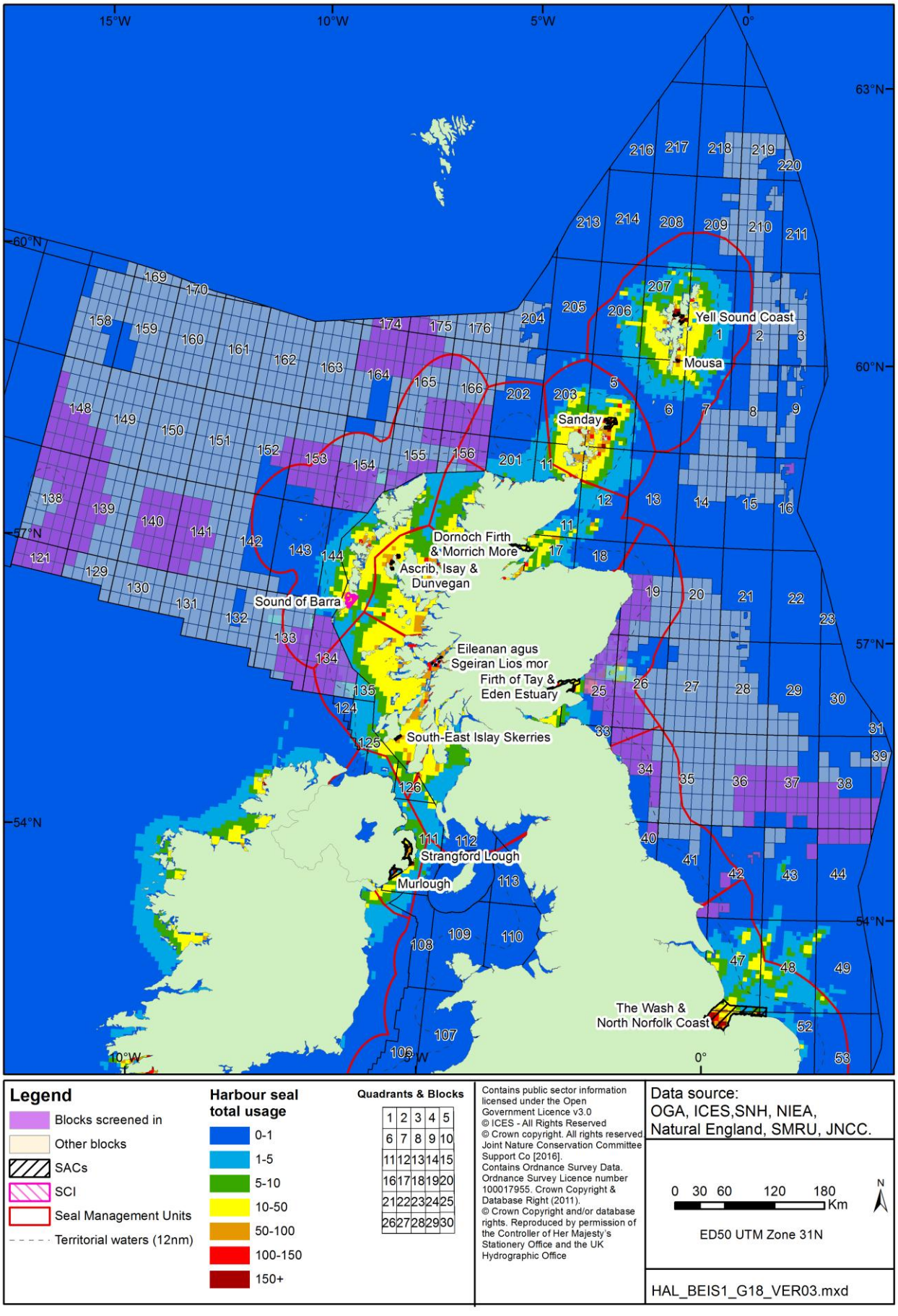


Figure 5.6: Estimated total density of grey seals in UK waters

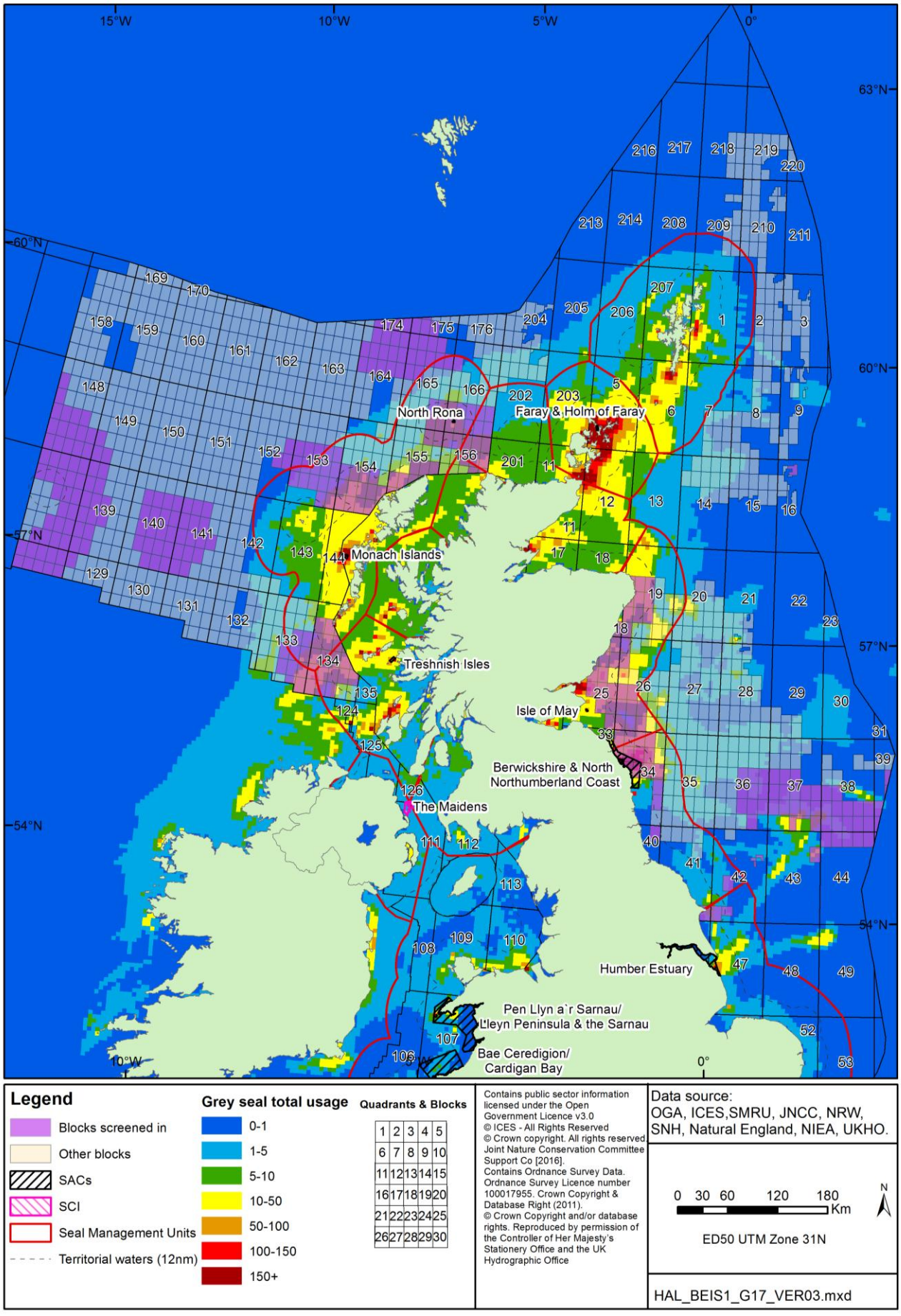


Figure 5.7: Bottlenose dolphin management units in the UK

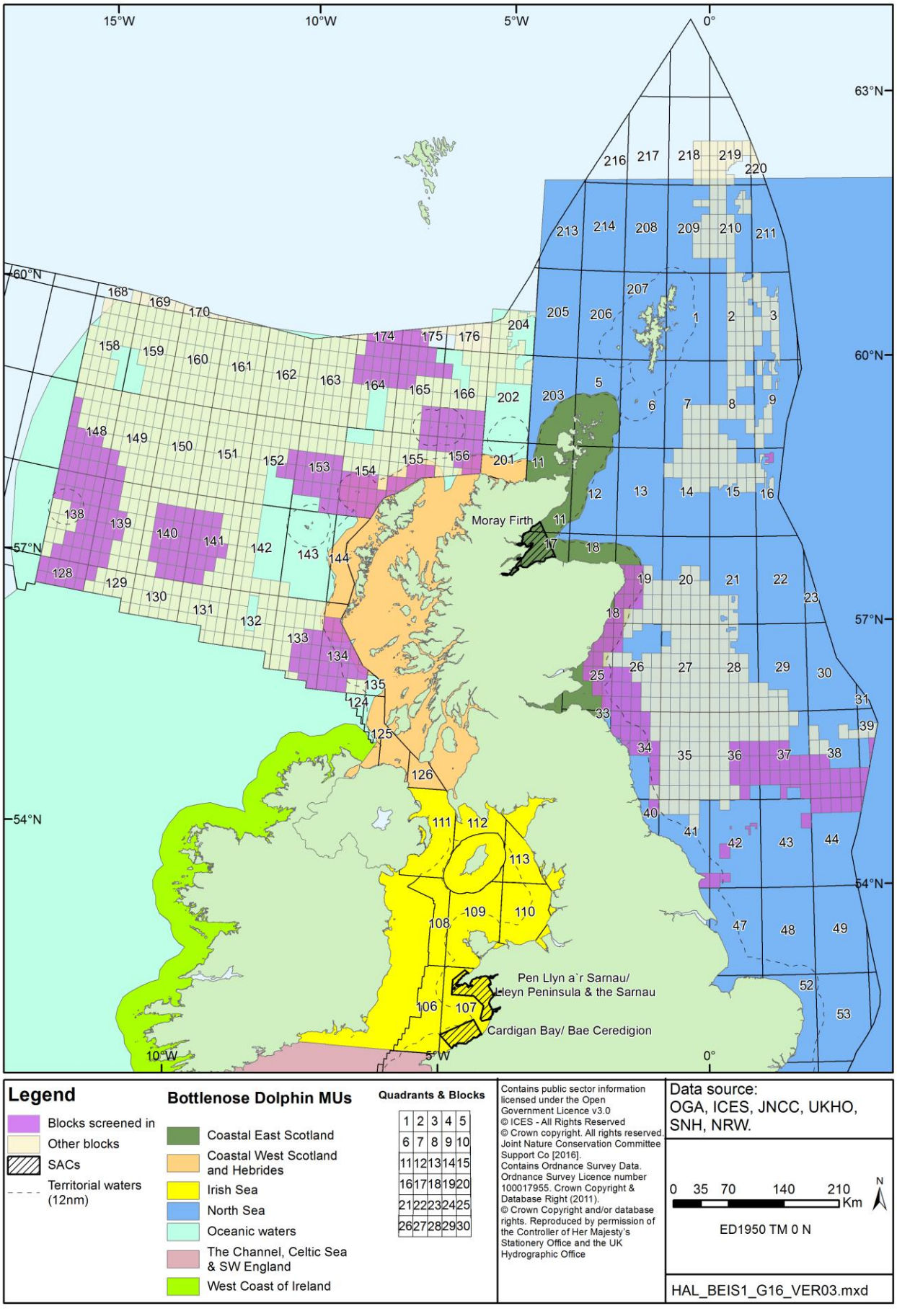
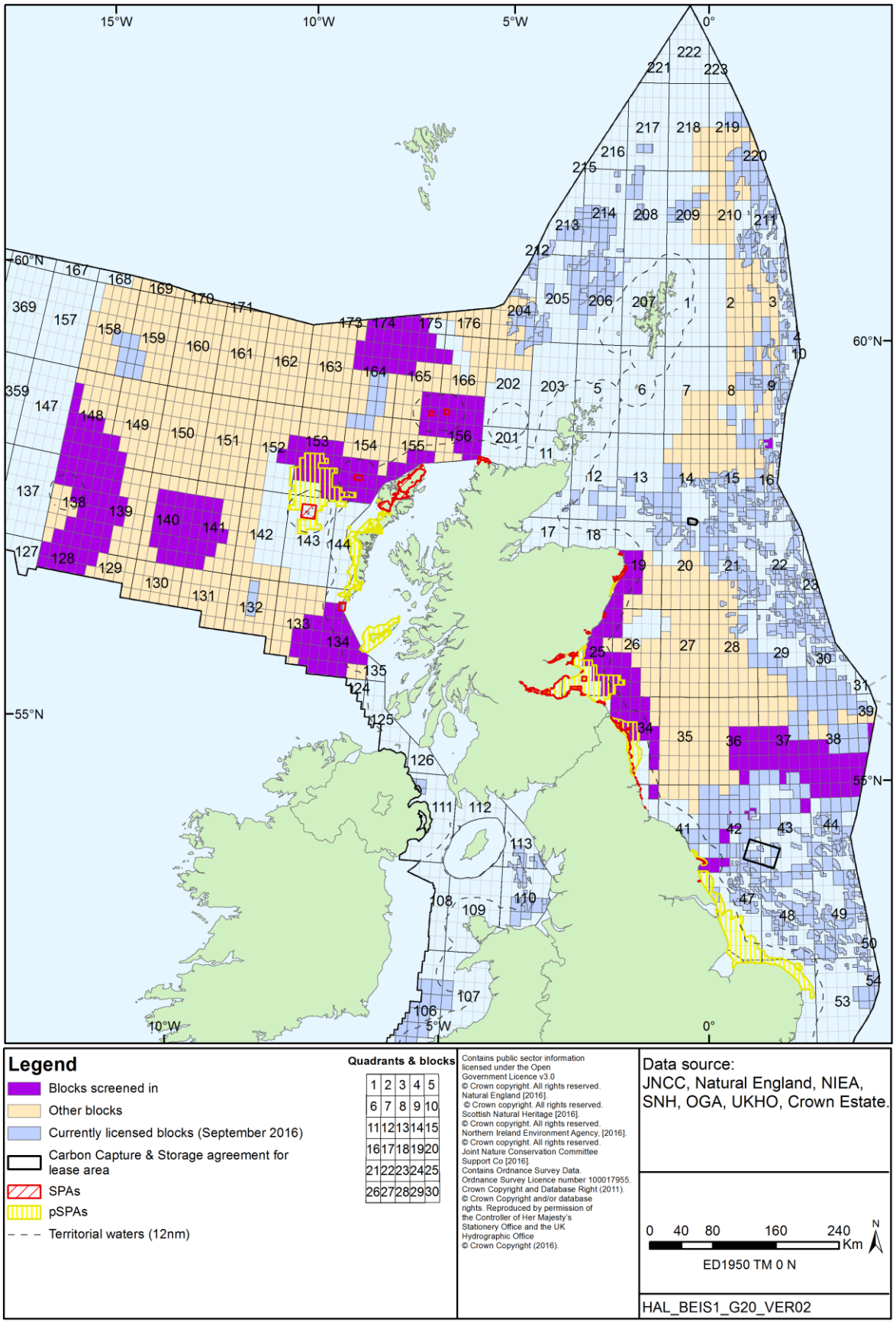
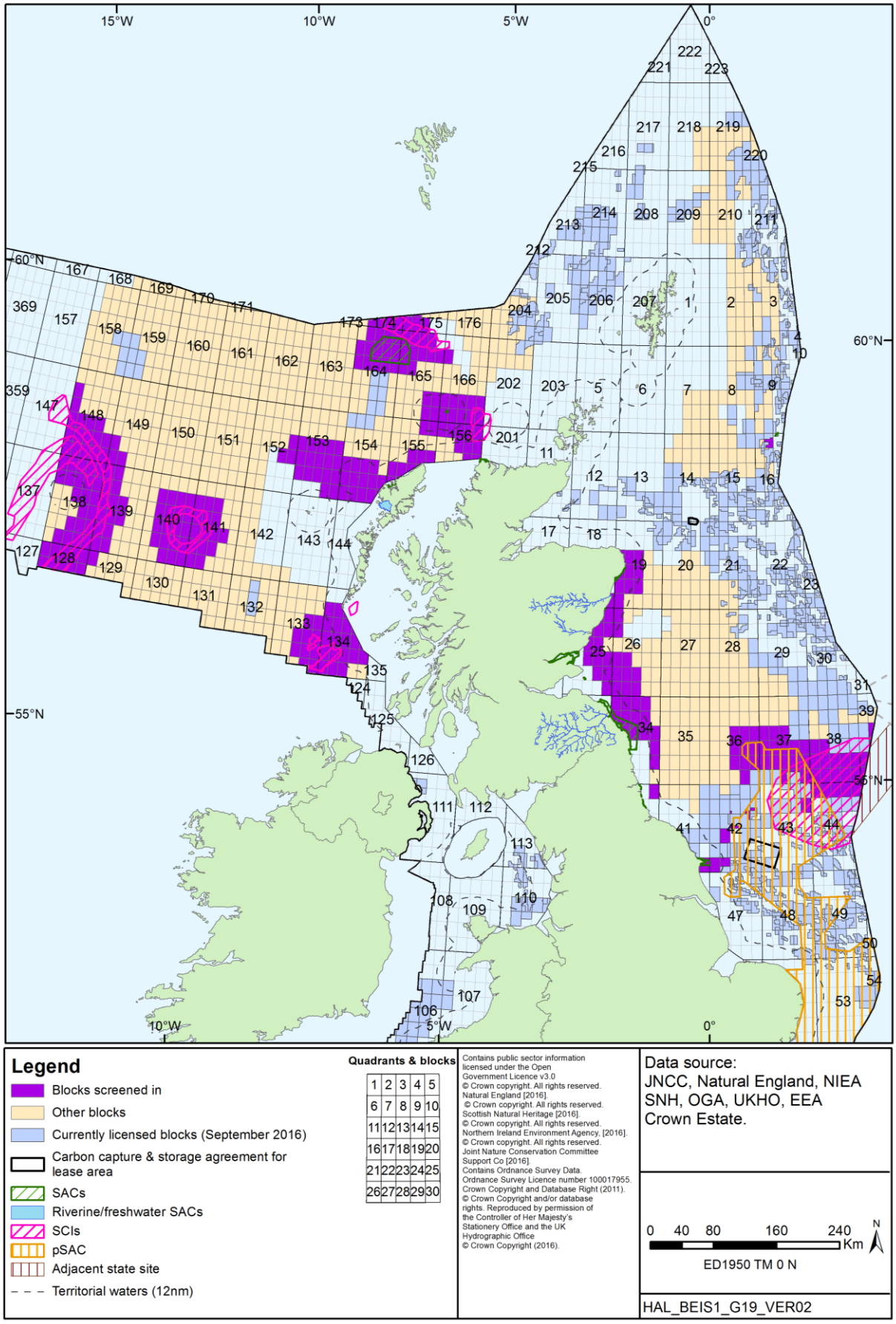


Figure 5.8: Existing oil and gas licences, CCS AfLs*, SPAs and 29th Round Blocks



**CCS AfLs= Carbon Capture and Storage Agreements for Lease*

Figure 5.9: Existing oil and gas licences, CCS AfLs*, SACs and 29th Round Blocks



**CCS AfLs= Carbon Capture and Storage Agreements for Lease*

Figure 5.10: Oil and gas infrastructure, SPAs and 29th Round Blocks

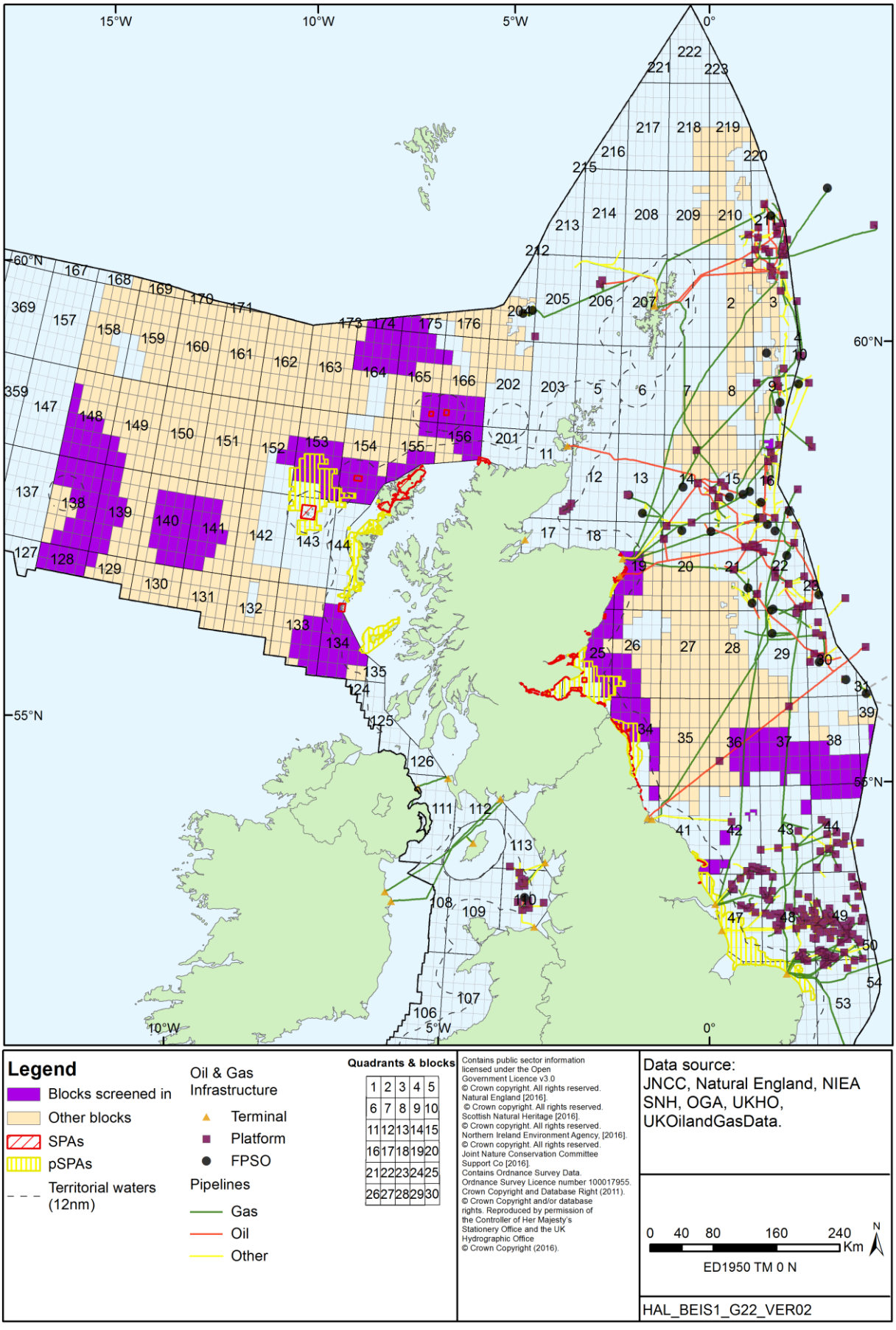


Figure 5.11: Oil and gas infrastructure, SACs and 29th Round Blocks

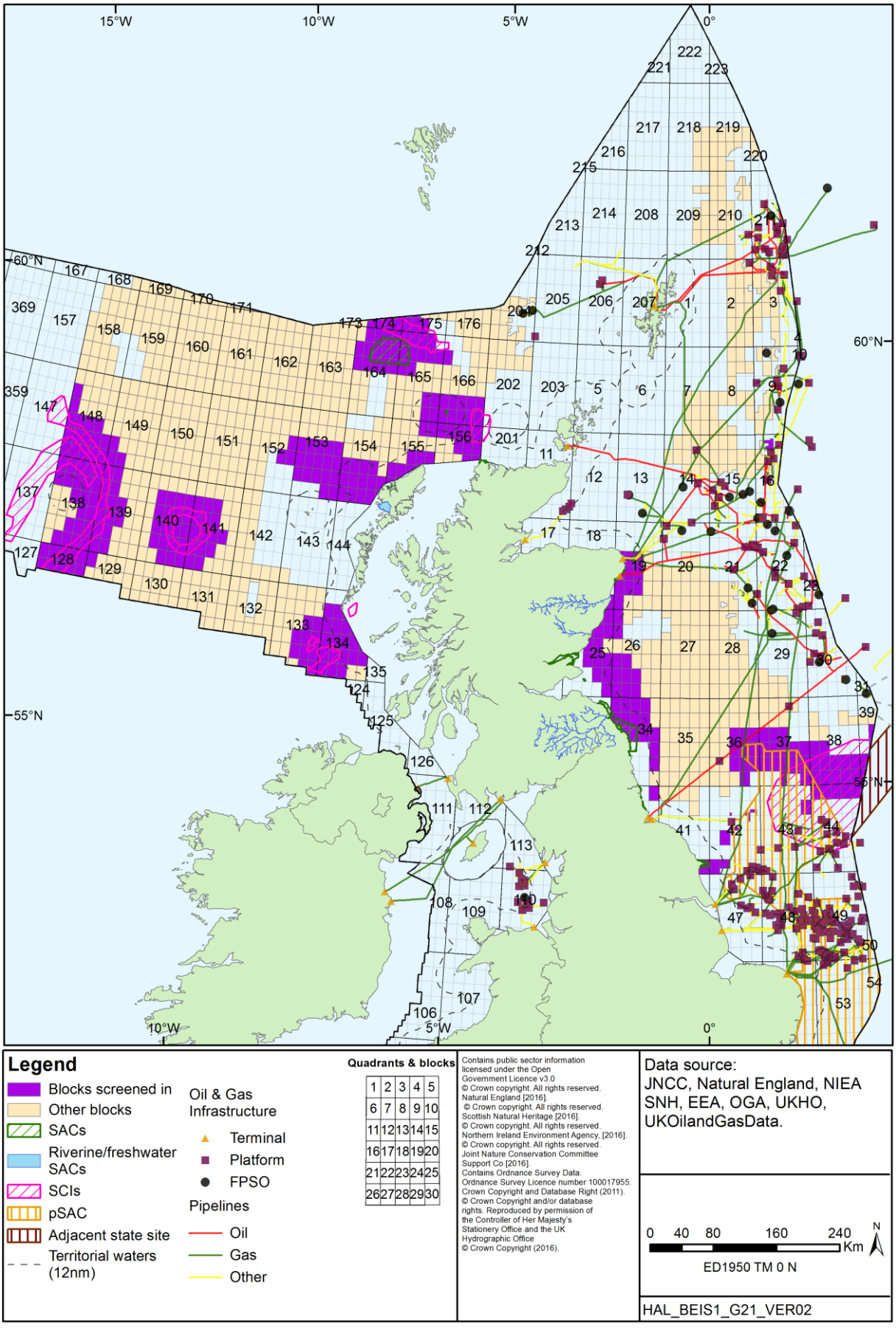


Figure 5.12: Marine renewable energy, SPAs and 29th Round Blocks

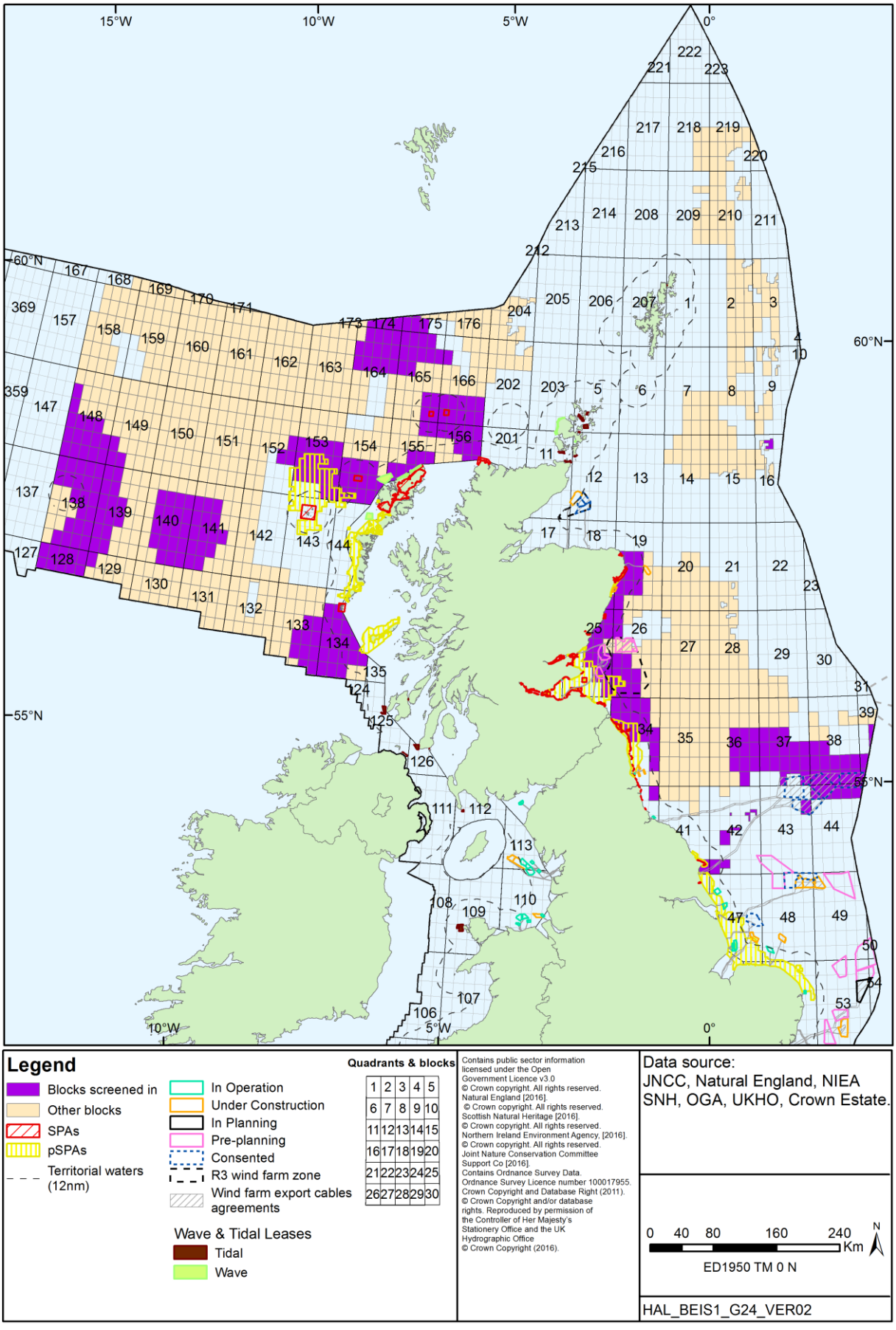


Figure 5.13: Marine renewable energy, SACs and 29th Round Blocks

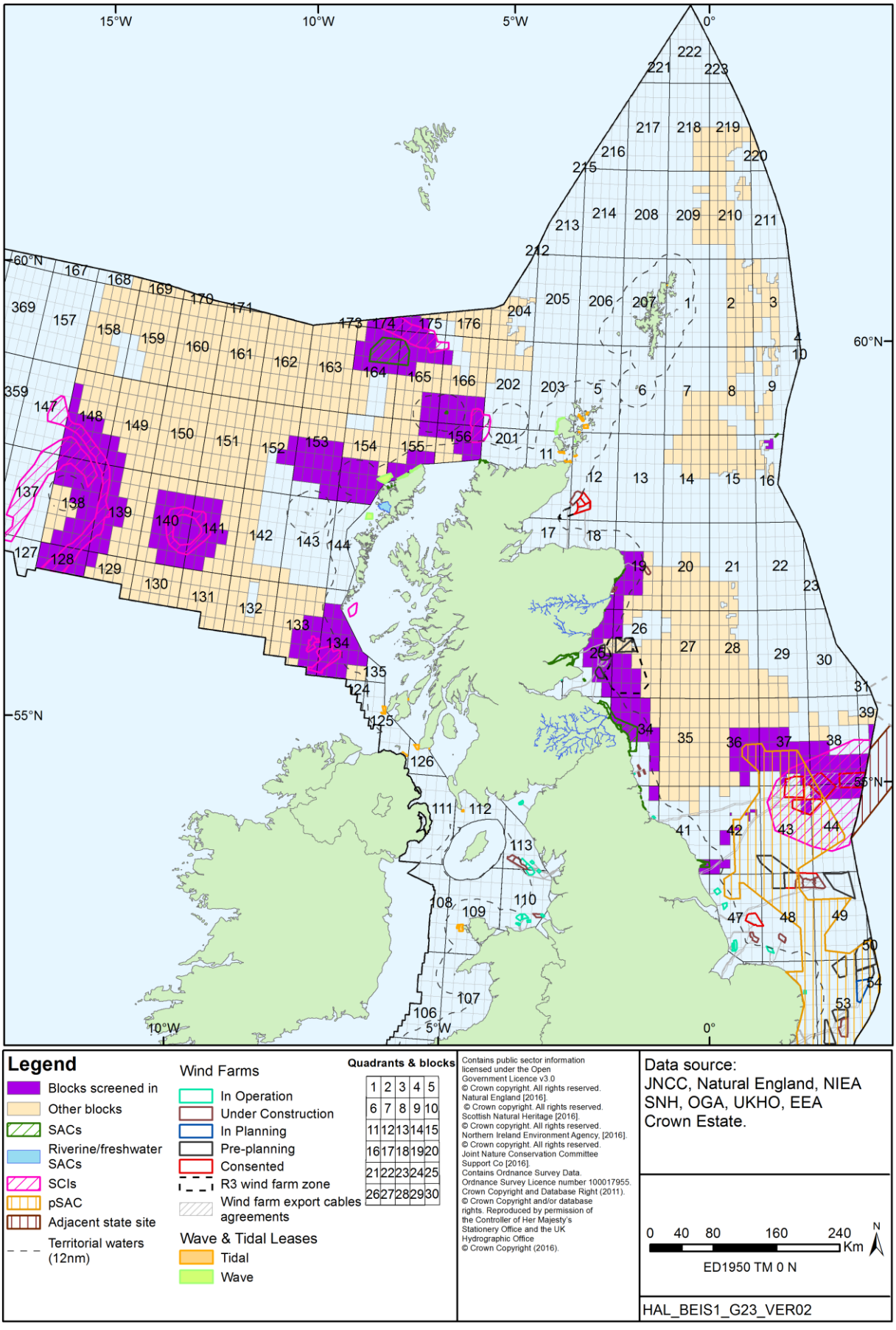


Figure 5.14: Navigation density, SPAs and 29th Round Blocks

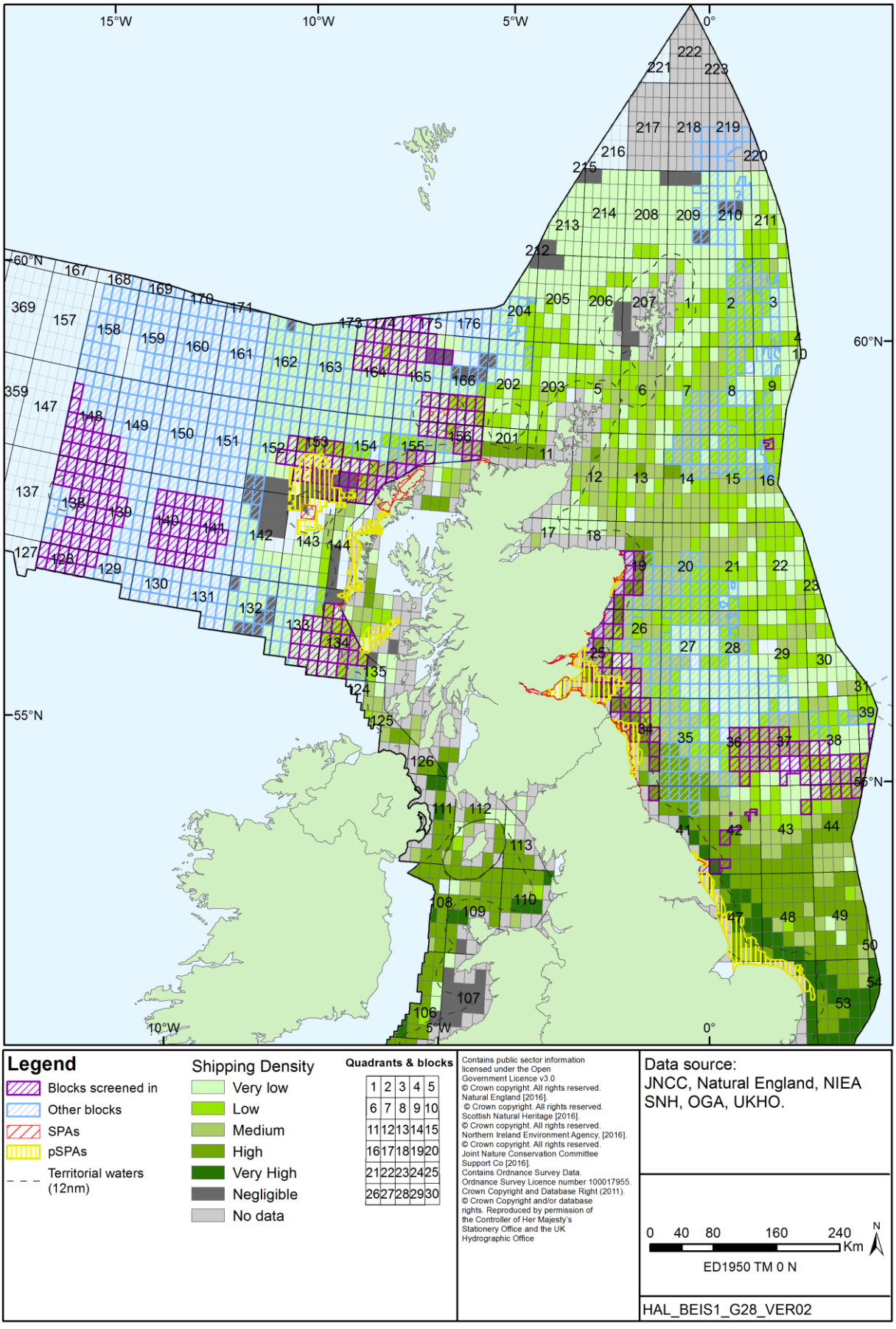
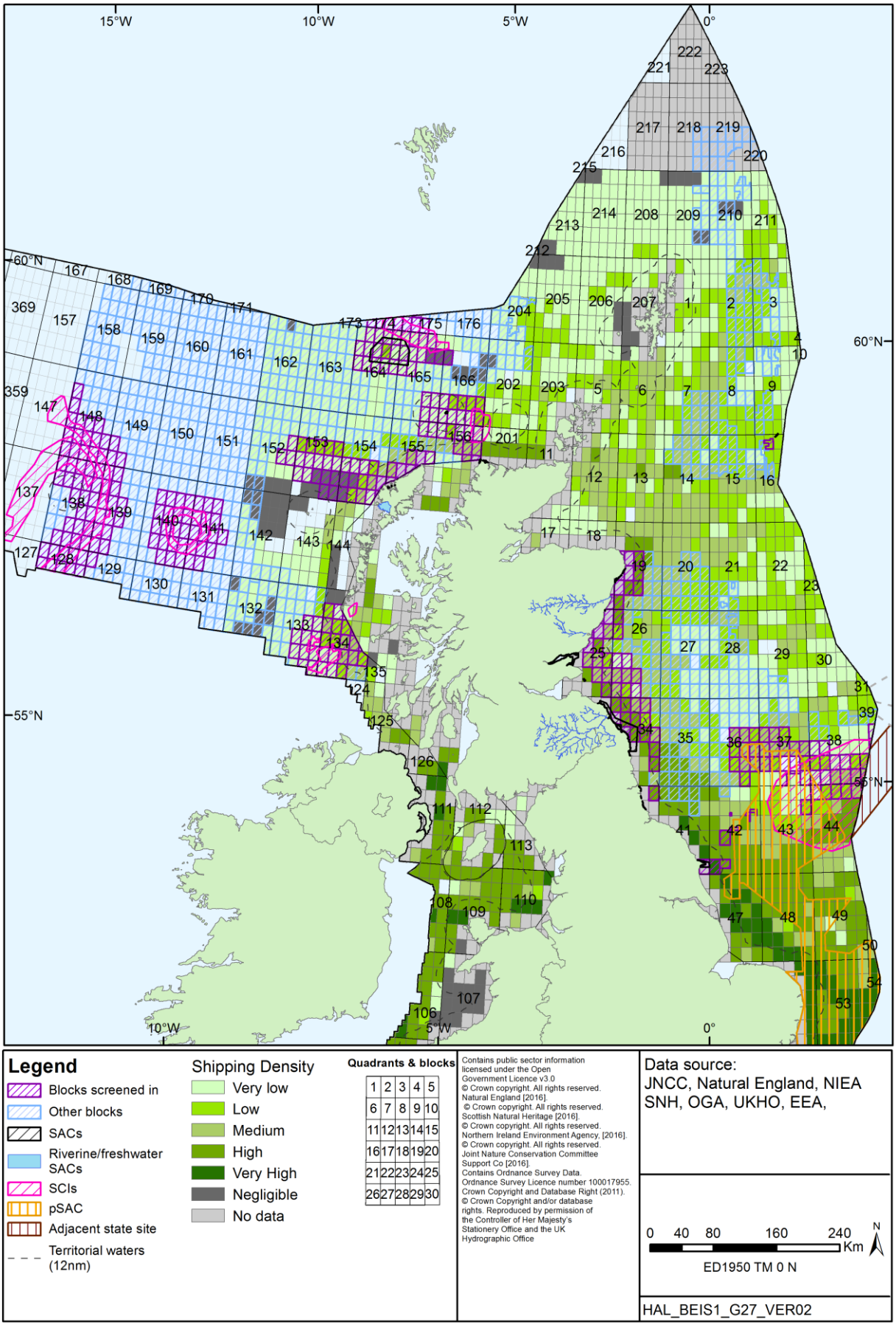


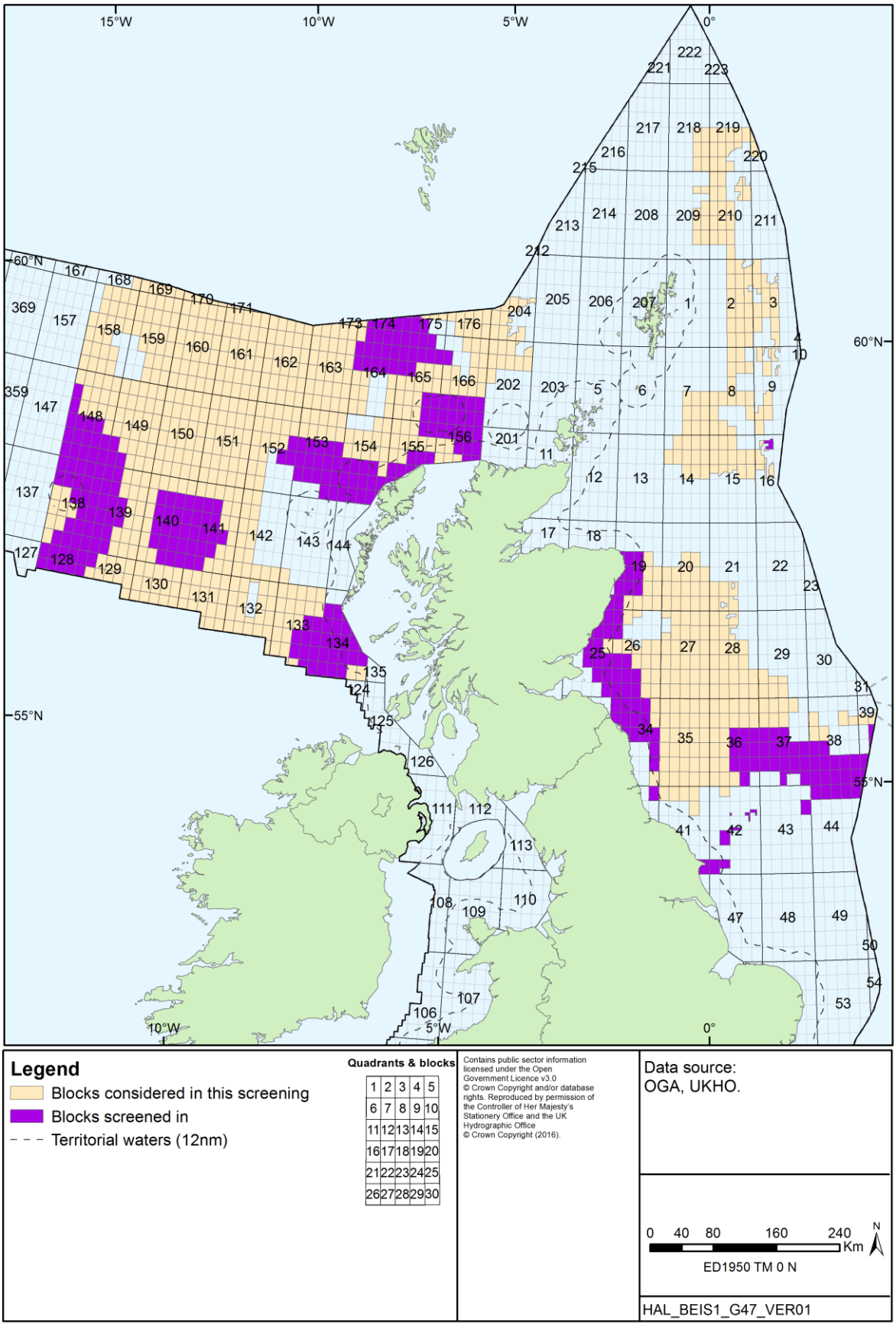
Figure 5.15: Navigation density, SACs and 29th Round Blocks



6 Conclusion

This screening assessment is based on the Blocks offered in the 29th Round and has considered the likelihood for significant effects on Natura 2000 sites from exploration/appraisal activities that could follow licensing of Blocks. The screening concluded that for the majority of the Blocks, licensing would not have the potential to cause significant effects on Natura 2000 site(s), on the understanding that subsequent field activities will be subject to activity specific permitting and HRA (where appropriate) to ensure appropriate mitigation measures are applied to planned operations and the prevention of potential for accidents, and that activities do not proceed where this would not be in accordance with the relevant permitting regimes. However, based on the screening results a number of Blocks which are being offered will be subject to a second stage of HRA, Appropriate Assessment, prior to decisions on the grant of such licences. These Blocks are listed in Table 5.1 and Appendix B (which includes relevant sites), and are also shown in Figure 6.1.

Figure 6.1: 29th Round Blocks for which a 2nd Stage of HRA will be undertaken



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Appendix A – The Designated Sites

A1 Introduction

The following maps and tables show the locations of potentially relevant European sites and their qualifying features with respect to the Blocks offered as part of the 29th Seaward Licensing Round.

The primary sources of site data were the latest JNCC SAC[29] (version as of 24th October 2016) and SPA[30] (version as of 24th October 2016) summary data and interest features and site characteristics were filtered for their coastal and marine relevance. The websites of the relevant Statutory Nature Conservation Bodies (SNCBs) were also reviewed to verify and augment site information including Scottish Natural Heritage (SNH)[31] and Natural England[32].

The sites in this Appendix are ordered thus:

A2 Coastal and marine Special Protection Areas

A3 Coastal and marine Special Areas of Conservation

A4 Offshore Special Areas of Conservation

A5 Riverine and freshwater Special Areas of Conservation

A6 Sites in the adjacent waters of other member states

A7 Ramsar sites

[29] Version as of 15th September 2016 - http://jncc.defra.gov.uk/page-1461

[30] Version as of 15th September 2016 - http://jncc.defra.gov.uk/page-1409

[31] http://gateway.snh.gov.uk/sitelink/index.jsp

[32] http://publications.naturalengland.org.uk/category/6490068894089216

A2 Coastal and Marine Special Protection Areas

Special Protection Areas (SPAs) are protected sites classified in accordance with Article 4 of the EC Birds Directive (2009/147/EC). Sites are classified for rare and vulnerable birds and for regularly occurring migratory birds. The SPAs included in this section are coastal sites which have been selected for the presence of one or more of the bird species listed in Box A.1 (below).

A number of marine SPAs, some of which provide marine extensions to existing sites, are presently at the proposed stage in Scottish inshore and offshore waters[33]. Ten of these sites were taken forward to public consultation in July 2016 (closed October 2016), with consultation on another four sites commencing in October 2016 (to conclude January 2017). Additionally, pSPAs are also present in English waters, and those of relevance to this screening are tabulated and shown in relevant maps below. Relevant SPAs in the adjacent waters of another Member State (Republic of Ireland) are included on Map A.1 and described in Section A6.

Box A.1: Migratory and/or Annex I bird species for which SPAs are selected in the UK

Divers and grebes	**Waders**
Great northern diver *Gavia immer*	Oystercatcher *Haematopus ostralegus*
Red-throated diver *Gavia stellata*	Avocet *Recurvirostra avosetta*
Black-throated diver *Gavia arctica*	Stone curlew *Burhinus oedicnemus*
Little grebe *Tachybaptus ruficollis*	Ringed plover *Charadrius hiaticula*
Great crested grebe *Podiceps cristatus*	Dotterel *Charadrius morinellus*
Slavonian grebe *Podiceps auritus*	Golden plover *Pluvialis apricaria*
	Grey plover *Pluvialis squatarola*
Seabirds	Lapwing *Vanellus vanellus*
Fulmar *Fulmarus glacialis*	Knot *Calidris canutus*
Manx shearwater *Puffinus puffinus*	Sanderling *Calidris alba*
Storm petrel *Hydrobates pelagicus*	Purple sandpiper *Calidris maritima*
Leach's petrel *Oceanodroma leucorhoa*	Dunlin *Calidris alpina alpina*
Gannet *Morus bassanus*	Ruff *Philomachus pugnax*
Cormorant *Phalacrocorax carbo carbo*	Snipe *Gallinago gallinago*
Shag *Phalacrocorax aristotelis*	Black-tailed godwit *Limosa limosa* (breeding)
Guillemot *Uria aalge*	Black-tailed godwit *Limosa limosa islandica* (non-breeding)
Razorbill *Alca torda*	Bar-tailed godwit *Limosa lapponica*
Puffin *Fratercula arctica*	Whimbrel *Numenius phaeopus*
	Curlew *Numenius arquata*
Gulls, terns and skuas	Redshank *Tringa totanus*
Arctic skua *Stercorarius parasiticus*	Greenshank *Tringa nebularia*
Great skua *Stercorarius skua*	Wood sandpiper *Tringa glareola*
Mediterranean gull *Larus melanocephalus*	Turnstone *Arenaria interpres*
Black-headed gull *Chroicocephalus ridibundus*	Red-necked phalarope *Phalaropus lobatus*

[33] http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/proposed-marine-spas/

Common gull *Larus canus*
Lesser black-backed gull *Larus fuscus*
Herring gull *Larus argentatus*
Great black-backed gull *Larus marinus*
Kittiwake *Rissa tridactyla*
Sandwich tern *Thalasseus sandvicensis*
Roseate tern *Sterna dougallii*
Common tern *Sterna hirundo*
Arctic tern *Sterna paradisaea*
Little tern *Sternula albifrons*

Crakes and rails

Corncrake *Crex crex*

Birds of prey and owls

Marsh harrier *Circus aeruginosus*
Hen harrier *Circus cyaneus*
Golden eagle *Aquila chrysaetos*
Osprey *Pandion haliaetus*
Merlin *Falco columbarius*
Peregrine *Falco peregrinus*
Short-eared owl *Asio flammeus*

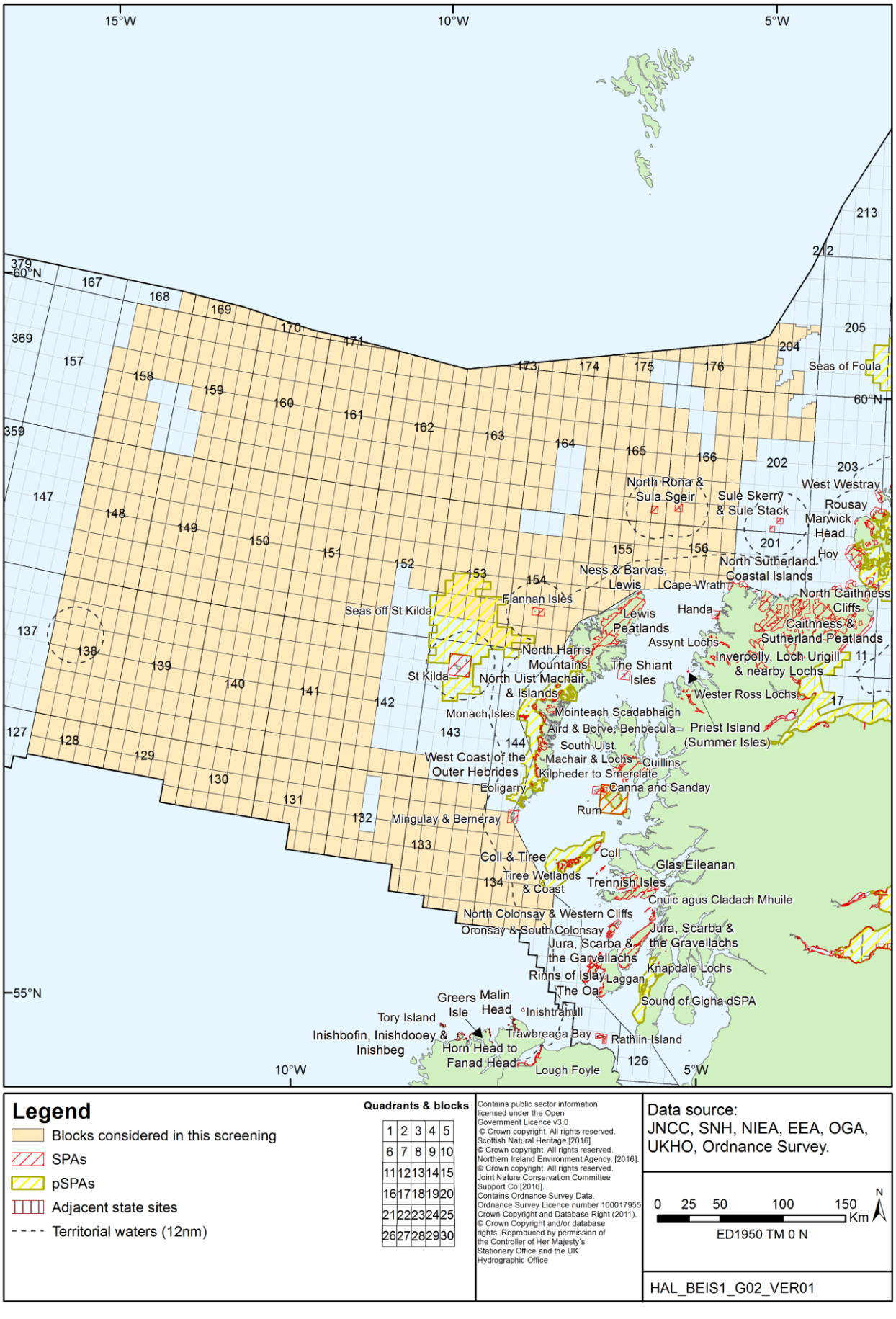
Other bird species

Fair Isle wren *Troglodytes troglodytes fridariensis*
Chough *Pyrrhocorax pyrrhocorax*

Waterfowl

Bewick's swan *Cygnus columbianus bewickii*
Whooper swan *Cygnus cygnus*
Pink-footed goose *Anser brachyrhynchus*
Greenland white-fronted goose *Anser albifrons flavirostris*
Icelandic greylag goose *Anser anser*
Greenland barnacle goose *Branta leucopsis*
Svalbard barnacle goose *Branta leucopsis*
Dark-bellied brent goose *Branta bernicla bernicla*
Canadian light-bellied brent goose *Branta bernicla hrota*
Svalbard light-bellied brent goose *Branta bernicla hrota*
Shelduck *Tadorna tadorna*
Wigeon *Anas penelope*
Gadwall *Anas strepera*
Teal *Anas crecca*
Mallard *Anas platyrhynchos*
Pintail *Anas acuta*
Shoveler *Anas clypeata*
Pochard *Aythya ferina*
Tufted duck *Aythya fuligula*
Scaup *Aythya marila*
Eider *Somateria mollissima*
Long-tailed duck *Clangula hyemalis*
Common scoter *Melanitta nigra*
Velvet scoter *Melanitta fusca*
Goldeneye *Bucephala clangula*
Red-breasted merganser *Mergus serrator*
Goosander *Mergus merganser*

Map A.1: Location of SPAs – West of Scotland



Legend

- Blocks considered in this screening
- SPAs
- pSPAs
- Adjacent state sites
- Territorial waters (12nm)

Quadrants & blocks

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30

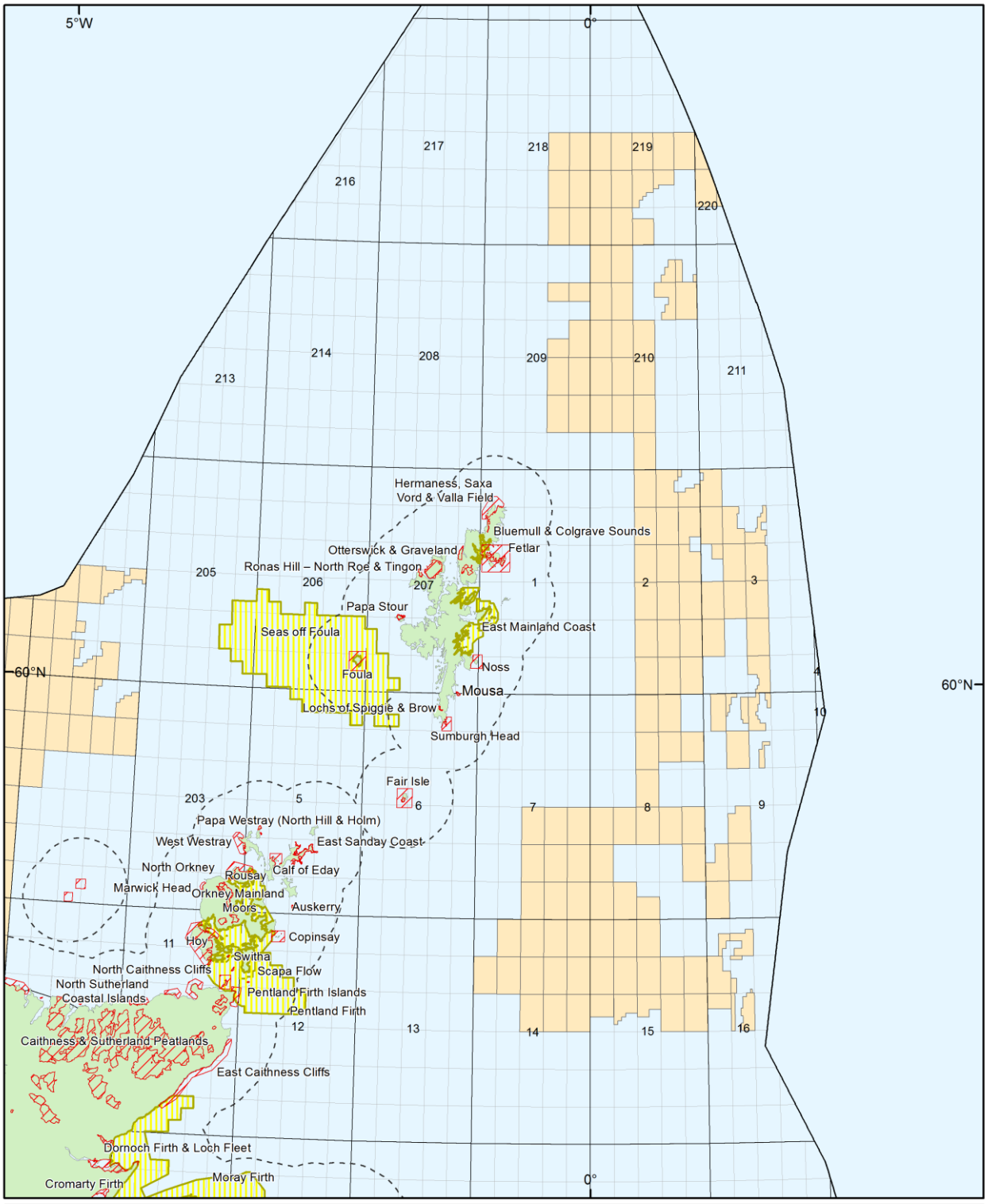
Data source:
JNCC, SNH, NIEA, EEA, OGA, UKHO, Ordnance Survey.

0 25 50 100 150 Km

ED1950 TM 0 N

HAL_BEIS1_G02_VER01

Map A.2: Location of SPAs – Northern North Sea



Map A.3: Location of SPAs – Mid North Sea High

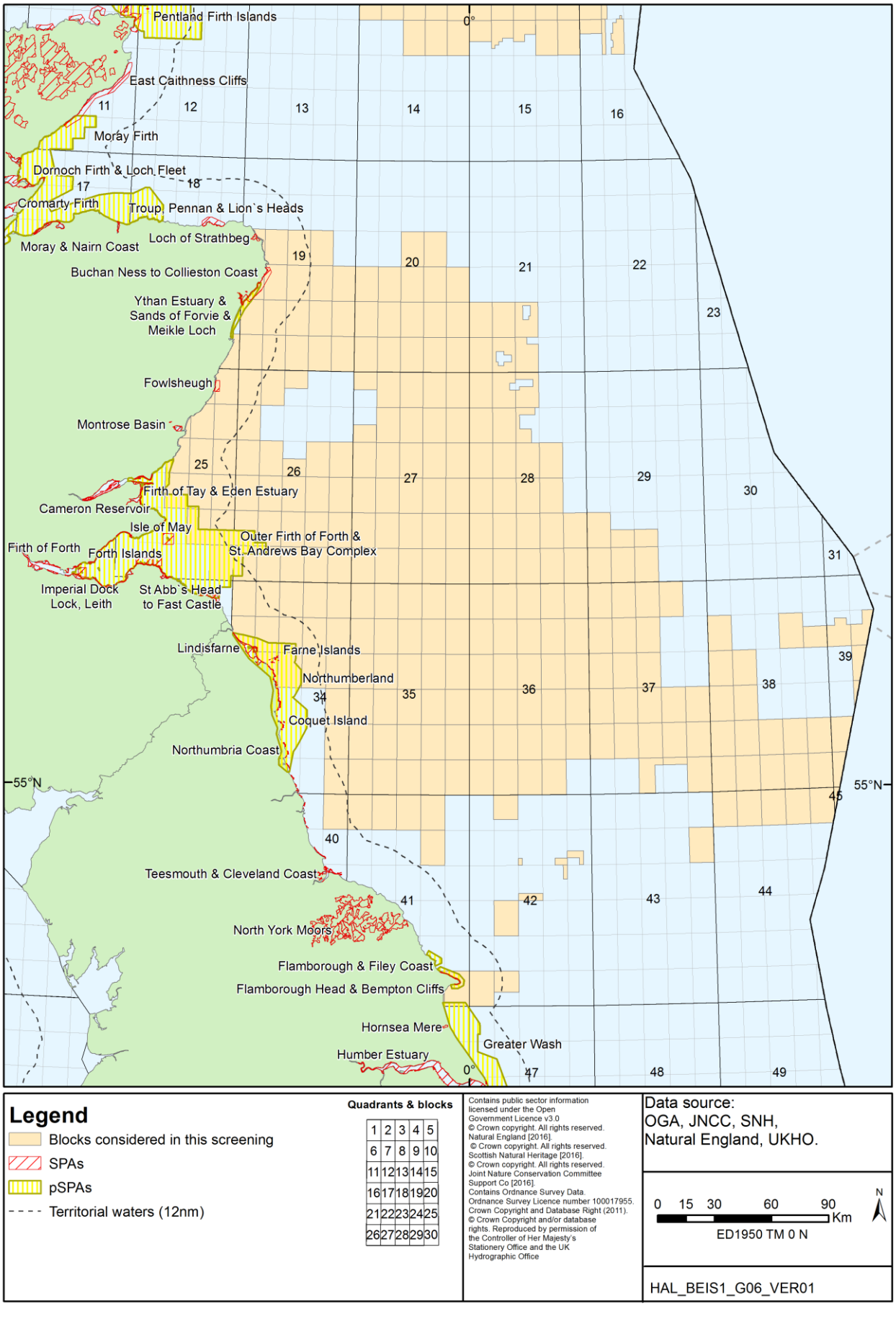


Table A.1: SPAs and their Qualifying Features

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
NORTHERN ISLES				
Hermaness, Saxa Vord and Valla Field SPA	6832.36	Breeding: Red-throated diver	Breeding: Gannet Great skua Puffin	Breeding: Seabirds
Bluemull and Colgrave Sounds pSPA	3823.27	Breeding: Red-throated diver	N/A	N/A
Fetlar SPA	16964.69	Breeding: Arctic tern Red-necked phalarope	Breeding: Dunlin Great skua Whimbrel	Breeding: Seabirds
Otterswick and Graveland SPA	2239.59	Breeding: Red-throated diver	N/A	N/A
Ronas Hill-North Roe and Tingon SPA	5474.35	Breeding: Red-throated diver Merlin	Breeding: Great skua	N/A
Papa Stour SPA	569.6	Breeding: Arctic tern	Breeding: Ringed plover	N/A
East Mainland Coast, Shetland pSPA	25646.67	Breeding: Red-throated diver Over winter: Great northern diver Slavonian grebe	Over winter: Eider Long-tailed duck Red-breasted merganser	N/A
Seas off Foula pSPA	341200	N/A	Breeding: Great skua	Breeding: Seabirds Over winter: Seabirds
Foula SPA	7985.49	Breeding: Arctic tern Leach's storm petrel Red-throated diver	Breeding: Great skua Guillemot Puffin Shag	Breeding: Seabirds
Noss SPA	3338.38	N/A	Breeding: Gannet Great skua Guillemot	Breeding: Seabirds
Mousa SPA	196.85	Breeding: Arctic tern Storm petrel	N/A	N/A
Lochs of Spiggie and Brow SPA	140.66	Over winter: Whooper swan	N/A	N/A

[34] A seabird assemblage of international importance: the area regularly supports at least 20,000 seabirds. Or, a wetland of international importance: the area regularly supports at least 20,000 waterfowl.

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
Sumburgh Head SPA	2478.91	Breeding: Arctic tern	N/A	Breeding: Seabirds
Fair Isle SPA	6825.1	Breeding: Arctic tern Fair Isle wren	Breeding: Guillemot	Breeding: Seabirds
Papa Westray (North Hill and Holm) SPA	245.94	Breeding: Arctic tern	Breeding: Arctic skua	N/A
West Westray SPA	3780.16	Breeding: Arctic tern	Breeding: Guillemot	Breeding: Seabirds
North Rona & Sula Sgeir SPA	6850.58	Breeding: Leach's petrel Storm petrel	Breeding: Gannet Guillemot	Breeding: Seabirds
East Sanday Coast SPA	1508.2	Over winter: Bar-tailed godwit	Over winter: Purple sandpiper Turnstone	N/A
Calf of Eday SPA	2671.77	N/A	N/A	Breeding: Seabirds
Rousay SPA	5480.84	Breeding: Arctic tern	N/A	Breeding: Seabirds
North Orkney pSPA	22695.17	Great northern diver Slavonian grebe Red-throated diver	Eider Long-tailed duck Velvet scoter Red-breasted merganser Shag	N/A
Marwick Head SPA	475.54	N/A	Breeding: Guillemot	Breeding: Seabirds
Orkney Mainland Moors SPA	5342.44	Breeding: Hen harrier Red-throated diver Short-eared owl Over winter: Hen harrier	N/A	N/A
Auskerry SPA	103.11	Breeding: Arctic tern Storm petrel	N/A	N/A
Copinsay SPA	3607.7	N/A	N/A	Breeding: Seabirds
Sule Skerry & Sule Stack SPA	3909.45	Breeding: Leach's storm petrel Storm petrel	Breeding: Gannet Puffin	Breeding: Seabird
Hoy SPA	18123.91	Breeding: Peregrine Red-throated diver	Breeding: Great skua	Breeding: Seabirds
Switha SPA	57.0	Over winter: Barnacle goose	N/A	N/A
Scapa Flow pSPA	37065.53	Breeding: Red-throated diver Over winter: Great northern diver Black-throated diver Slavonian grebe	Over winter: Shag Eider Long-tailed duck Goldeneye Red-breasted merganser	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
Pentland Firth Islands SPA	170.0	Breeding: Arctic tern	N/A	N/A
Pentland Firth marine pSPA	97325	Breeding: Arctic tern	N/A	Breeding: Seabirds
WEST SCOTLAND				
Cape Wrath SPA	6734.48	N/A	N/A	Breeding: Seabirds
North Sutherland Coastal Islands SPA	223.46	Over winter: Barnacle goose	N/A	N/A
Ness & Barvas, Lewis SPA	647.54	Breeding: Corncrake	N/A	N/A
Flannan Isles SPA	5832.82	Breeding: Leach's petrel	N/A	Breeding: Seabirds
Handa SPA	3205.61	N/A	Breeding: Guillemot Razorbill	Breeding: Seabirds
Lewis Peatlands SPA	58959.88	Breeding: Black-throated diver Golden eagle Golden plover Merlin Red-throated diver	Breeding: Dunlin Greenshank	N/A
Caithness & Sutherland Peatlands SPA	145312.97	Breeding: Black-throated diver Golden eagle Golden plover Hen harrier Merlin Red-throated diver Short-eared owl Wood sandpiper	Breeding: Dunlin Common scoter Greenshank Widgeon	N/A
Seas off St Kilda pSPA	399500	Breeding: Storm petrel (as part of an assemblage)	Breeding: Gannet	Breeding: Seabirds
Assynt Lochs SPA	1158.19	Breeding: Black-throated diver	N/A	N/A
North Harris Mountains SPA	13128.46	Breeding: Golden eagle	N/A	N/A
Inverpolly, Loch Urigill and Nearby Lochs SPA	1937.05	Breeding: Black-throated diver	N/A	N/A
St Kilda SPA	29014.62	Breeding: Leach's petrel Storm petrel	Migrating: Gannet Great skua Puffin	Breeding: Seabirds
Priest Island SPA	132.02	Breeding: Storm petrel	N/A	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
The Shiant Isles SPA	6935.65	Over winter: Barnacle goose	Breeding: Razorbill Puffin Shag	Breeding: Seabirds
Wester Ross Lochs SPA	1989.82	Breeding: Black-throated diver	N/A	N/A
North Uist Machair & Islands SPA	4860.13	Breeding: Corncrake Over winter: Barnacle goose	Breeding: Dunlin Ringed plover Oystercatcher Redshank Over winter: Ringed plover Turnstone Purple sandpiper	N/A
Mointeach Scadabhaigh SPA	4182.75	Breeding: Black-throated diver Red-throated diver	N/A	N/A
Monach Isles SPA	600.07	Breeding: Little tern Common tern Over winter: Barnacle goose	Breeding: Black guillemot	N/A
Aird & Borve, Benbecula SPA	359.03	Breeding: Corncrake	N/A	N/A
West Coast of the Outer Hebrides pSPA	132170.04	Breeding: Red-throated diver Over winter: Great northern diver Black-throated diver Slavonian grebe	Over winter: Eider Long-tailed duck Red-breasted merganser	N/A
South Uist Machair & Lochs SPA	5027.31	Breeding: Corncrake Little tern	Breeding: Dunlin Oystercatcher Redshank Ringed plover Over winter: Ringed plover Sanderling	N/A
Cuillins SPA	29503.25	Breeding: Golden Eagle	N/A	N/A
Kilpheder to Smerclate, South Uist SPA	379.64	Breeding: Corncrake	N/A	N/A
Eoligarry, Barra SPA	143.59	Breeding: Corncrake	N/A	N/A
Canna and Sanday SPA	6567.58	N/A	N/A	Breeding: Seabirds

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
Rum SPA	46724.16	Breeding: Golden eagle Red throated-diver *(proposed as a new feature, consultation ends September 2016)*	Breeding: Manx shearwater	Breeding: Seabirds
Mingulay & Berneray SPA	7801.71	N/A	Breeding: Razorbill	Breeding: Seabirds
Coll SPA	2324.37	Over winter: Greenland white-fronted goose Barnacle goose	N/A	N/A
Coll & Tiree pSPA	79475.15	Over winter: Great northern diver	Over winter: Eider	N/A
Sléibhtean agus Cladach Thiriodh (Tiree Wetlands & Coast) SPA	1939.72	Over winter: Greenland white-fronted goose Barnacle goose	Breeding: Dunlin Oystercatcher Redshank Ringed plover Over winter: Turnstone Ringed plover	N/A
Treshnish Isles SPA	241.77	Breeding: Storm petrel Over winter: Barnacle goose	N/A	N/A
Glas Eileanan SPA	1.57	Breeding: Common tern	N/A	N/A
Cnuic agus Cladach Mhuile (Mull Coast and Hills) SPA	29242.12	Resident: Golden eagle	N/A	N/A
North Colonsay and Western Cliffs SPA	3297.3	Breeding: Chough Over winter: Chough	N/A	Breeding: Seabirds
Oronsay and South Colonsay SPA	2016.85	Breeding: Corncrake Chough Over winter: Chough	N/A	N/A
Jura, Scarba and the Garvellachs SPA	34585.96	Resident: Golden eagle	N/A	N/A
Knapdale Lochs SPA	113.86	Breeding: Black-throated diver	N/A	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
Gruinart Flats, Islay SPA	3256.32	Breeding: Chough Over winter: Barnacle goose Greenland white-fronted goose Chough	Over winter: Canadian light-bellied brent goose	N/A
Rinns of Islay SPA	9434.09	Breeding: Chough Corncrake Hen harrier On passage: Whooper swan Over winter: Greenland white-fronted goose Chough	Breeding: Common scoter	N/A
Bridgend Flats, Islay SPA	332.08	Over winter: Barnacle goose	N/A	N/A
Eilean na Muice Duibhe (Duich Moss), Islay SPA	577.27	Over winter: Greenland white-fronted goose	N/A	N/A
Laggan, Islay SPA	1225.62	Over winter: Barnacle goose Greenland white-fronted goose	N/A	N/A
Sound of Gigha pSPA	36326.83	Great northern diver	Eider Red-breasted merganser	N/A
The Oa SPA	1930.84	Breeding: Chough	N/A	N/A
NORTHERN IRELAND				
Rathlin Island SPA	3344.62	Breeding: Peregrine	Breeding: Guillemot Razorbill Kittiwake	Breeding: Seabirds
Lough Foyle SPA	2204.36	Over winter: Bar-tailed godwit Berwick's swan Golden plover Whooper swan	Over winter: Light-bellied brent goose	Over winter: Waterfowl
EAST SCOTLAND				
North Caithness Cliffs SPA	14628.77	Breeding: Peregrine	Breeding: Guillemot	Breeding: Seabird

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
Caithness and Sutherland Peatlands SPA	145312.97	Breeding: Black-throated diver Golden eagle Golden plover Hen harrier Merlin Red-throated diver Short-eared owl Wood sandpiper	Breeding: Dunlin Common scoter Greenshank Widgeon	N/A
East Caithness Cliffs SPA	11696.37	Breeding: Peregrine	Breeding: Razorbill Herring gull Shag Kittiwake Guillemot	Breeding: Seabird
Dornoch Firth and Loch Fleet SPA	7856.54	Breeding: Osprey Over winter: Bar-tailed godwit	Over winter: Greylag goose Widgeon	Over winter: Waterfowl
Cromarty Firth SPA	3247.95	Breeding: Common tern Osprey Over winter: Bar-tailed godwit Whooper swan	Over winter: Greylag goose	Over winter: Waterfowl
Moray Firth pSPA	176235.95	Over winter: Great northern diver Red-throated diver Slavonian grebe	Breeding: Shag Over winter: Scaup Eider Long-tailed duck Common scoter Velvet scoter Common goldeneye Red-breasted merganser	N/A
Troup, Pennan and Lion's Heads SPA	3365.2	N/A	Breeding: Guillemot Kittiwake	Breeding: Seabirds
Moray and Nairn Coast SPA	2325.67	Breeding: Osprey Over winter: Bar-tailed godwit	Over winter: Greylag goose Pink-footed goose Redshank	Over winter: Waterfowl
Loch of Strathbeg SPA	616.26	Breeding: Sandwich tern Over winter: Whooper swan Barnacle goose	Over winter: Teal Greylag goose Pink-footed goose	Over winter: Waterfowl
Buchan Ness to Collieston Coast SPA	5400.76	N/A	N/A	Breeding: Seabirds

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	1014.62	Breeding: Common tern Little tern Sandwich tern	Over winter: Pink-footed goose	Over winter: Waterfowl
Ythan Estuary, Sands of Forvie and Meikle Loch (extension) pSPA	6051.39	Breeding: Sandwich tern Little tern	N/A	N/A
Fowlsheugh SPA	1303.23	N/A	Breeding: Guillemot Kittiwake	Breeding: Seabirds
Montrose Basin SPA	981.19	N/A	Over winter: Greylag goose Knot Pink-footed goose Oystercatcher Redshank	Over winter: Waterfowl
Firth of Tay and Eden Estuary SPA	6947.62	Breeding: Little tern Marsh harrier Over winter: Bar-tailed godwit	Over winter: Greylag goose Pink-footed goose Redshank	Over winter: Waterfowl
Outer Firth of Forth and St Andrews Bay Complex pSPA	272068	Breeding: Common tern Arctic tern Over-winter: Red-throated diver Little gull Slavonian grebe	Breeding: Shag Gannet Over-winter: Eider	Breeding: Seabirds Over winter: Seabirds Waterfowl
Forth Islands SPA	9795.0	Breeding: Roseate tern Common tern Sandwich tern Arctic tern	Breeding: Puffin Lesser black-backed gull Gannet Shag	Breeding: Seabirds
Firth of Forth SPA	6317.69	Over winter: Red-throated diver Bar-tailed godwit Golden plover Slavonian grebe On passage: Sandwich tern	Over winter: Pink-footed goose Turnstone Knot Shelduck Redshank	Over winter: Waterfowl
Imperial Dock Lock, Leith SPA	0.11	Breeding: Common tern	N/A	N/A
St Abb's Head to Fast Castle SPA	1736.75	N/A	N/A	Breeding: Seabirds

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
NORTHEAST ENGLAND				
Lindisfarne SPA	3671.03	Breeding: Little tern Over winter: Bar-tailed godwit Golden plover Whooper swan	On passage: Ringed plover Over winter: Grey plover Greylag goose Knot Light-bellied brent goose Widgeon	Over winter: Waterfowl
Farne Islands SPA	101.23	Breeding: Arctic tern Common tern Roseate tern Sandwich tern	Breeding: Guillemot Puffin	Breeding: Seabirds
Northumberland Marine pSPA	88687	Breeding: Sandwich tern Common tern Arctic tern Roseate tern Little tern	Breeding: Puffin Guillemot	Breeding: Seabirds
Coquet Island SPA	19.92	Breeding: Arctic tern Common tern Roseate tern Sandwich tern	Breeding: Puffin	Breeding: Seabirds
Northumbria Coast SPA	1097.44	Breeding: Little tern	Over winter: Purple sandpiper Turnstone	N/A
Teesmouth and Cleveland Coast SPA	1247.31	Breeding: Little tern On passage: Sandwich tern	On passage: Ringed plover Over winter: Knot Redshank	Over winter: Waterfowl
North York Moors SPA	44053.29	Breeding: Golden plover Merlin	N/A	N/A
Flamborough and Filey Coast pSPA	8039.6	N/A	Breeding: Kittiwake Gannet Guillemot Razorbill	Breeding: Seabirds
Flamborough Head and Bempton Cliffs SPA	212.17	N/A	Breeding: Kittiwake	Breeding: Seabirds
Hornsea Mere SPA	232.25	N/A	Over winter: Gadwall	N/A
Greater Wash pSPA	360640.1	Breeding: Little tern Sandwich tern Common tern Over winter: Little gull Red-throated diver	Over winter: Common scoter	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[34]
Humber Estuary SPA	37630.24	Breeding: Bittern Marsh harrier Avocet Little tern Over winter: Bittern Avocet Hen harrier Bar-tailed godwit Golden plover On passage: Ruff	Over winter: Dunlin Knot Shelduck Black-tailed godwit Redshank On passage: Knot Dunlin Black-tailed godwit Redshank	Non-breeding: Waterfowl

A3 Coastal and marine Special Areas of Conservation

This section includes coastal or nearshore marine (within 12nm boundary) Special Areas of Conservation (SAC) which contain one or more of the Annex I habitats listed in Box A.2 (below) or Annex II qualifying marine species. Relevant offshore (out with or crossing the 12nm boundary) SACs are included on the maps here and are described in Section A4. Riverine/freshwater SACs which are designated for migratory fish and/or freshwater pearl mussel are included on Maps A.4 to A.6 and considered in Section A5. Relevant SACs in the waters of adjacent Member States are also included on Maps A.4 to A.6 and described in Section A6.

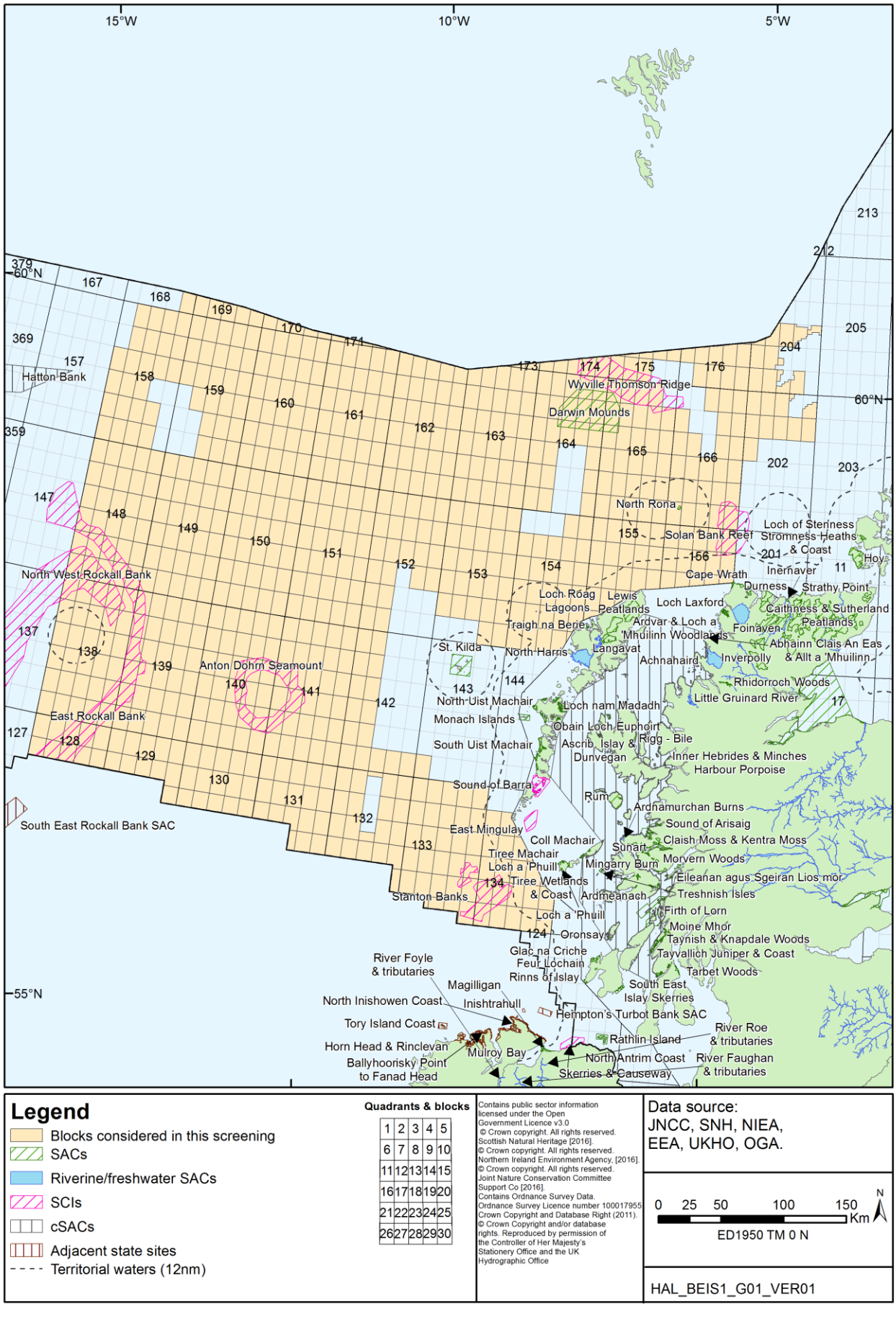
Abbreviations for the Annex I habitats used in SAC site summaries (Tables A.2 and A.3) are listed in Box A.2.

Box A.2: Annex I Habitat abbreviations used in site summaries

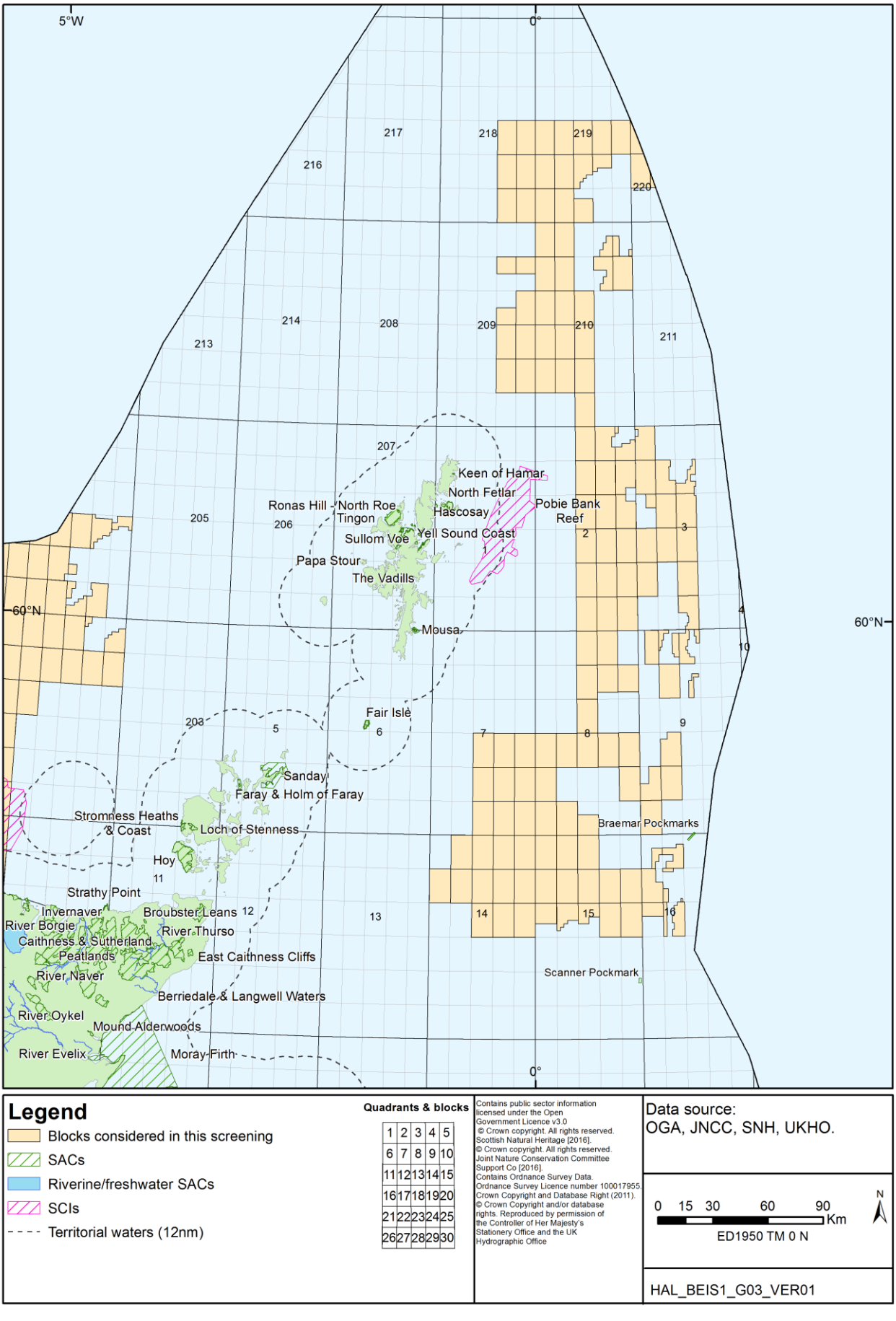
Annex I Habitat (abbreviated)	Annex I Habitat(s) (full description)
Bogs	Blanket bogs * Priority feature Transition mires and quaking bogs Depressions on peat substrates of the *Rhynchosporion* Active raised bogs * Priority feature Degraded raised bogs still capable of natural regeneration Bog Woodland * Priority feature
Coastal dunes	Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") Fixed coastal dunes with herbaceous vegetation ("grey dunes") * Priority feature Humid dune slacks Embryonic shifting dunes Decalcified fixed dunes with *Empetrum nigrum* * Priority feature Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) * Priority feature Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) Coastal dunes with *Juniperus* spp. Dunes with *Hippophae rhamnoides* Fixed dunes with herbaceous vegetation (`grey dunes`) * Priority feature
Coastal lagoons	Coastal lagoons * Priority feature
Estuaries	Estuaries
Fens	Alkaline fens Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* * Priority feature Petrifying springs with tufa formation (*Cratoneurion*) * Priority feature
Forest	Western acidic oak woodland Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) * Priority feature *Taxus baccata* woods of the British Isles *Priority feature *Tilio-Acerion* forests of slopes, screes and ravines * Priority feature Old sessile oak woods and *Ilex* and *Blechnum* in the British Isles Old sessile oak woods with *Quercus robur* on sandy plains

Annex I Habitat (abbreviated)	Annex I Habitat(s) (full description)
Grasslands	Alpine and subalpine calcareous grasslands Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels Siliceous alpine and boreal grasslands Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe) * Priority feature Alpine pioneer formations of the *Caricion bicoloris-atrofuscae* * Priority feature Calaminarian grasslands of the *Violetalia calaminariae* *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (important orchid sites) * Priority feature
Heaths	Northern Atlantic wet heaths with *Erica tetralix* European dry heaths Alpine and Boreal heaths Dry Atlantic coastal heaths with *Erica vagans*
Inlets and bays	Large shallow inlets and bays
Limestone pavements	Limestone pavements * Priority feature
Machairs	Machairs
Mudflats and sandflats	Mudflats and sandflats not covered by seawater at low tide
Reefs	Reefs
Rocky slopes	Calcareous rocky slopes with chasmophytic vegetation Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*) Siliceous rocky slopes with chasmophytic vegetation
Running freshwater	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
Salt meadows	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) *Salicornia* and other annuals colonising mud and sand *Spartina* swards (*Spartinion maritimae*)
Sandbanks	Sandbanks which are slightly covered by sea water all the time
Scree	Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)
Scrub (mattoral)	*Juniperus communis* formations on heaths or calcareous grasslands
Sea caves	Submerged or partially submerged sea caves
Sea cliffs	Vegetated sea cliffs of the Atlantic and Baltic Coasts
Standing freshwater	Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* Natural dystrophic lakes and ponds Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
Vegetation of drift line	Annual vegetation of drift lines
Vegetation of stony banks	Perennial vegetation of stony banks

Map A.4: Location of SACs – West of Scotland



Map A.5: Location of SACs – Northern North Sea



Map A.6: Location of SACs – Mid North Sea High

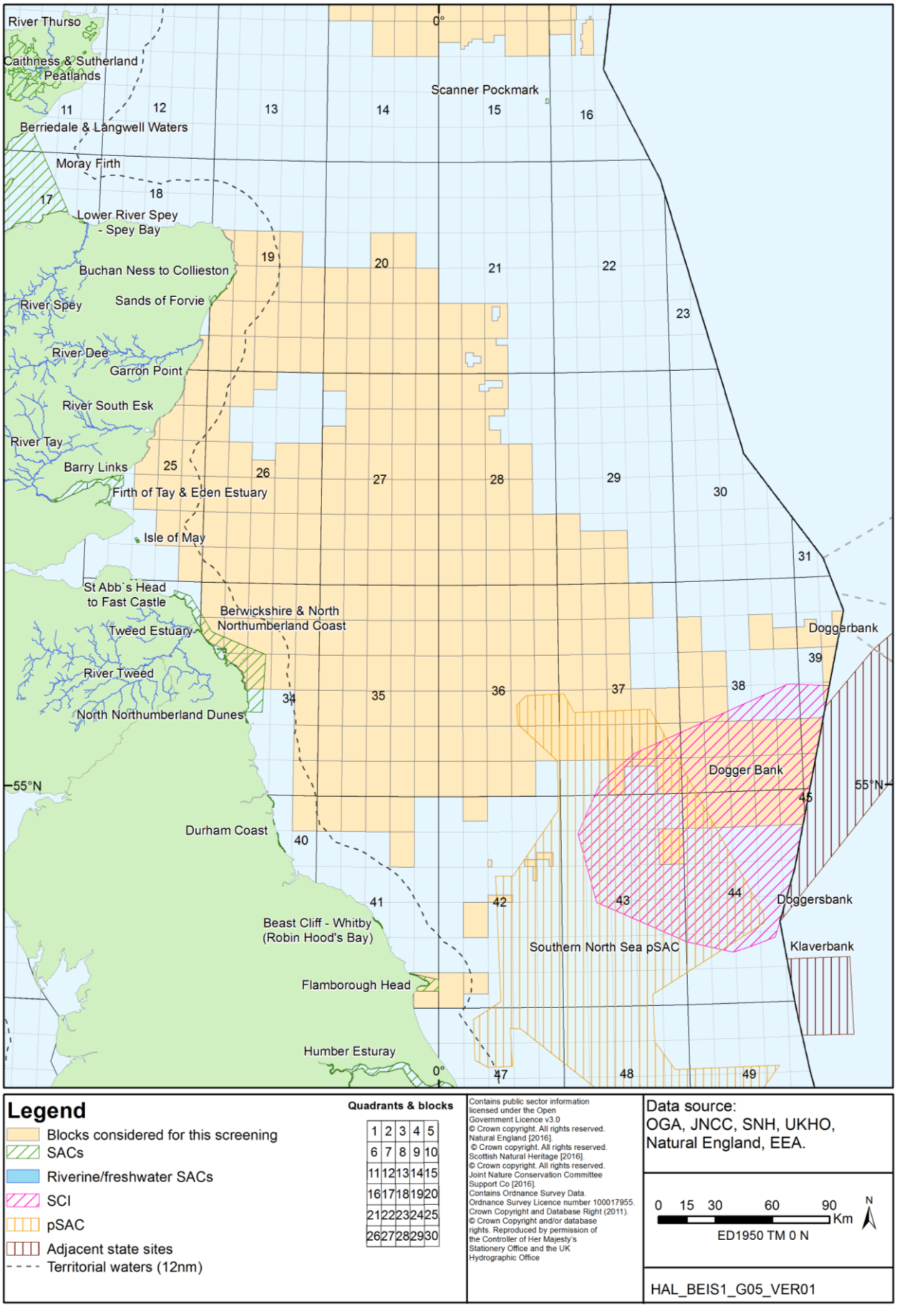


Table A.2: SACs and their Qualifying Features

Site Name	Area (ha)	Annex I Habitat Primary	Annex I Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
NORTHERN ISLES					
Keen of Hamar SAC	39.87	Grasslands Scree	Heaths	N/A	N/A
Hascosay SAC	164.19	Bogs	N/A	N/A	Otter
North Fetlar SAC	1585.18	Heaths Fens	N/A	N/A	N/A
Ronas Hill – North Roe SAC	4903.57	Standing freshwater Heaths Bogs	Heaths Scree	N/A	N/A
Yell Sound Coast SAC	1544.44	N/A	N/A	Otter *Lutra lutra* Harbour seal *Phoca vitulina*	N/A
Sullom Voe SAC	2691.43	Inlets and bays	Coastal lagoons Reefs	N/A	N/A
Mousa SAC	529.74	N/A	Reefs Sea caves	Harbour seal *Phoca vitulina*	N/A
Fair Isle SAC	561.05	Sea cliffs	Heaths	N/A	N/A
Sanday SAC	10976.97	Reefs	Sandbanks Mudflats and sandflats	Harbour seal *Phoca vitulina*	N/A
North Rona SAC	628.53	N/A	Reefs Sea cliffs Sea caves	Grey seal *Halichoerus grypus*	N/A
Faray and Holm of Faray SAC	781.33	N/A	N/A	Grey seal *Halichoerus grypus*	N/A
Stromness Heaths and Coast SAC	638.26	Sea cliffs Heaths	Fens	N/A	N/A
Loch of Stenness SAC	792.59	Coastal lagoons	N/A	N/A	N/A
Hoy SAC	9501.27	Sea cliffs Standing freshwater Heaths Bog	Heaths Fens Rocky slopes	N/A	N/A
WEST SCOTLAND					
Cape Wrath SAC	1009.75	Sea cliffs	N/A	N/A	N/A
Strathy Point SAC	207	Sea cliffs	N/A	N/A	N/A
Durness SAC	1213.8	Coastal dunes Standing freshwater Grasslands Limestone pavements	Coastal dunes Heaths Grasslands Fens	N/A	Otter *Lutra lutra*
Invernaver SAC	287.67	Coastal dunes Heaths Grasslands	Coastal dunes Fens	N/A	N/A
Oldshoremore & Sandwood SAC	446.2	Coastal dunes Machairs	Coastal dunes	N/A	N/A
Loch Laxford SAC	1214.54	Inlets and bays	Reefs	N/A	N/A
Lewis Peatlands SAC	27955.02	Standing freshwater Bogs	Heaths Bogs	N/A	Otter *Lutra lutra*
Loch Roag Lagoons SAC	43.14	Coastal lagoons	N/A	N/A	N/A

Site Name	Area (ha)	Annex I Habitat Primary	Annex I Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Tràigh na Berie SAC	153.54	Machairs	N/A	N/A	N/A
Caithness & Sutherland Peatlands SAC	143561.47	Standing freshwater Bogs	Heaths Bogs	Otter *Lutra lutra* Marsh saxifrage *Saxifraga hirculus*	N/A
Achnahaird SAC	21.55	N/A	N/A	Petalwort *Petalophyllum ralfsii*	N/A
Inverpolly SAC	11881.94	Standing freshwater Heaths Bogs	Heaths Grassland Scree Rocky slopes Forest	Otter *Lutra lutra*	Freshwater pearl mussel *Margaritifera margaritifera*
St Kilda SAC	25467.57	Reefs Sea cliffs Sea caves	N/A	N/A	N/A
Loch nam Madadh SAC	2320.9	Coastal lagoons Inlets and bays	Sandbanks Mudflats and sandflats Reefs	Otter *Lutra lutra*	N/A
North Uist Machair SAC	3039.34	Salt meadows Machairs Standing freshwater	Vegetation of drift lines Coastal dunes	N/A	Slender naiad *Najas flexilis*
Obain Loch Euphoirt SAC	348.28	Coastal lagoons	N/A	N/A	N/A
Monach Islands SAC	3646.56	Machairs	Coastal dunes	Grey seal *Halichoerus grypus*	N/A
Ascrib, Islay and Dunvegan SAC	2577.99	N/A	N/A	Harbour seal *Phoca vitulina*	N/A
Rigg - Bile SAC	499.64	Sea cliffs	Forest	N/A	N/A
South Uist Machair SAC	3437.71	Machairs Standing freshwater	Coastal lagoons Vegetation of drift lines Coastal dunes	Slender naiad *Najas flexilis*	Otter *Lutra lutra*
Inner Hebrides and the Minches cSAC	1353977	N/A	N/A	Harbour porpoise *Phocoena phocoena*	N/A
Sound of Barra SCI	12507.39	Sandbanks Reefs	N/A	N/A	Harbour seal *Phoca vitulina*
Rum SAC	10839.74	Standing freshwater Heaths Grasslands Scree	Sea cliffs Heaths Grasslands Bogs Fens Scree Rocky slopes	Otter *Lutra lutra*	N/A
East Mingulay SCI	11510.87	Reefs	N/A	N/A	N/A
Sound of Arisaig (Loch Ailort to Loch Ceann Traigh) SAC	4544.27	Sandbanks	N/A	N/A	N/A
Claish Moss and Kentra Moss SAC	1018.82	Bogs	Bogs	N/A	N/A
Sunart SAC	10230.22	Forest	Reefs Heaths Forest	Otter *Lutra lutra*	N/A
Coll Machair SAC	854.24	Coastal dunes Machairs	Coastal dunes Standing freshwater	Slender naiad *Najas flexilis*	N/A

Site Name	Area (ha)	Annex I Habitat Primary	Annex I Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Tiree Machair SAC	789.37	Coastal dunes Machairs Standing freshwater	Coastal dunes	N/A	N/A
Loch a' Phuill SAC	152.44	Standing freshwater	N/A	N/A	N/A
Morvern Woods SAC	1924.86	Forests	N/A	N/A	Otter *Lutra lutra*
Treshnish Isles SAC	1962.66	N/A	Reefs	Grey seal *Halichoerus grypus*	N/A
Eileanan agus Sgeiran Lios mor SAC	1139.49	N/A	N/A	Harbour seal *Phoca vitulina*	N/A
Mull Oakwoods SAC	1405.45	Forests	N/A	N/A	Otter *Lutra lutra*
Ardmeanach SAC	378.33	Grassland	Sea cliffs	N/A	N/A
Firth of Lorn SAC	20999.35	Reefs	N/A	N/A	N/A
Moine Mhor SAC	1149.02	Bogs	Mudflats and sandflats Salt marshes and salt meadows Forests	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia* Otter *Lutra lutra*
Oronsay SAC	340.02	Machairs	N/A	N/A	N/A
Taynish and Knapdale Woods SAC	1017.95	Forests	Standing freshwater	Marsh fritillary butterfly *Euphydryas* (*Eurodryas, Hypodryas*) *aurinia*	Otter *Lutra lutra*
Tayvallich Juniper and Coast SAC	1213.13	Scrub (matorral)	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*	Otter *Lutra lutra*
Glac na Criche SAC	263.36	Bogs	Sea cliffs Heaths	N/A	Marsh fritillary butterfly *Euphydryas* (*Eurodryas, Hypodryas*) *aurinia*
Tarbert Woods SAC	1576.29	Forests	N/A	N/A	N/A
Rinns of Islay SAC	1085.0	N/A	N/A	Marsh fritillary butterfly *Euphydryas* (*Eurodryas, Hypodryas*) *aurinia*	N/A
South-East Islay Skerries SAC	1500.41	N/A	N/A	Harbour seal *Phoca vitulina*	N/A
NORTHERN IRELAND					
Rathlin Island SAC	3344.62	Reefs Sea cliffs Sea caves	Sandbanks Vegetation of drift lines	N/A	N/A
Skerries and Causeway SCI	10862	Reefs Sandbanks Sea caves	N/A	N/A	Harbour porpoise *Phocoena phocoena*

Site Name	Area (ha)	Annex I Habitat Primary	Annex I Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
North Antrim Coast SAC	314.59	Sea cliffs	Vegetation of drift lines Salt marshes and salt meadows Coastal dunes Grasslands	Narrow-mouthed whorl snail *Vertigo angustior*	N/A
Magilligan SAC	1058.22	Coastal dunes	Coastal dunes	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia* Petalwort *Petalophyllum ralfsii*
EAST SCOTLAND					
Mound Alderwoods SAC	299.52	Forests	N/A	N/A	N/A
Moray Firth SAC	151273.99	N/A	Sandbanks	Bottlenose dolphin *Tursiops truncatus*	N/A
Lower River Spey - Spey Bay SAC	654.26	Vegetation of stony banks Forests	N/A	N/A	N/A
Buchan Ness to Collieston SAC	206.03	Sea cliffs	N/A	N/A	N/A
Sands of Forvie SAC	735.48	Coastal dunes	N/A	N/A	N/A
Garron Point SAC	15.01	N/A	N/A	Narrow-mouthed whorl snail *Vertigo angustior*	N/A
Barry Links SAC	770.44	Coastal dunes	N/A	N/A	N/A
Firth of Tay and Eden Estuary SAC	15441.63	Estuaries	Sandbanks Mudflats and sandflats	Harbour seal *Phoca vitulina*	N/A
Isle of May SAC	356.64	N/A	Reefs	Grey seal *Halichoerus grypus*	N/A
St Abb's Head to Fast Castle SAC	122.63	Sea cliffs	N/A	N/A	N/A
NORTHEAST ENGLAND					
Tweed Estuary SAC	156.24	Estuaries Mudflats and sandflats	N/A	N/A	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*
Berwickshire and North Northumberland Coast SAC	65226.12	Mudflats and sandflats Inlets and Bays Reefs Sea caves	N/A	Grey seal *Halichoerus grypus*	N/A
North Northumberland Dunes SAC	1127.27	Coastal dunes	N/A	Petalwort *Petalophyllum ralfsii*	N/A
Durham Coast SAC	389.61	Sea cliffs	N/A	N/A	N/A
Beast Cliff - Whitby (Robin Hood's Bay) SAC	265.48	Sea cliffs	N/A	N/A	N/A

Site Name	Area (ha)	Annex I Habitat Primary	Annex I Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Flamborough Head SAC	6320.87	Reefs Sea cliffs Sea caves	N/A	N/A	N/A
Southern North Sea pSAC (extends beyond 12nm)	3695766	N/A	N/A	Harbour porpoise *Phocoena phocoena*	N/A
Humber Estuary SAC	36657.15	Estuaries Mudflats and sandflats	Sandbanks Salt marshes and salt meadows Coastal lagoons Coastal dunes	N/A	River lamprey *Lampetra fluviatilis* Sea lamprey *Petromyzon marinus* Grey seal *Halichoerus grypus*
Saltfleetby - Theddlethorpe Dunes and Gibraltar Point SAC	967.65	Coastal dunes	Coastal dunes	N/A	N/A

A4 Offshore Special Areas of Conservation

Table A.3: Offshore SACs and their Qualifying Features

Site Name	Area (ha)	Annex 1 Habitat	Annex II Species
WEST OF SCOTLAND			
Wyville Thomson Ridge cSAC/SCI	173995	Reefs	N/A
Hatton Bank cSAC	1569433	Reefs	N/A
Darwin Mounds SAC	137726	Reefs	N/A
Solan Bank Reef cSAC/SCI	85593	Reefs	
North West Rockall Bank cSAC/SCI	436526	Reefs	N/A
East Rockall Bank cSAC/SCI	369489	Reefs	N/A
Anton Dohrn Seamount cSAC/SCI	142861	Reefs	N/A
Stanton Banks SAC	81727	Reefs	N/A
NORTHERN NORTH SEA			
Pobie Bank cSAC/SCI	96575	Reefs	N/A
Braemar Pockmarks SAC	518	Submarine structures made by leaking gases	N/A
Scanner Pockmark SAC	335	Submarine structures made by leaking gases	N/A
MID NORTH SEA HIGH			
Dogger Bank cSAC/SCI	1233115	Sandbanks	N/A

A5 Riverine and Freshwater Special Areas of Conservation

Table A.4: Relevant riverine and freshwater SACs designated for migratory fish and/or the freshwater pearl mussel

Site name	Freshwater pearl mussel *Margaritifera margaritifera*	Migratory fish[1]
WEST OF SCOTLAND		
River Borgie SAC	✓	AS
River Thurso SAC	-	AS
River Naver SAC	✓	AS
Abhainn Clais An Eas and Allt a'Mhuilinn SAC	✓	-
Foinaven SAC	✓	-
Ardvar & Loch a' Mhuilinn Woodlands SAC	✓	-
Inverpolly SAC	✓	-
Langavat SAC	-	AS
North Harris SAC	✓	AS
Little Gruinard River SAC	-	AS
Ardnamurchan Burns SAC	✓	-
Mingarry Burn SAC	✓	-
River Roe and Tributaries SAC	-	AS
River Foyle and Tributaries SAC	-	AS
River Faughan and Tributaries SAC	-	AS
NORTHERN NORTH SEA		
River Borgie SAC	✓	AS
River Thurso SAC	-	AS
River Naver SAC	✓	AS
Berriedale and Langwell Waters SAC	-	AS
River Evelix SAC	✓	-
MID NORTH SEA HIGH		
Berriedale and Langwell Waters SAC	-	AS
River Oykel SAC	✓	AS
River Evelix SAC	✓	-
River Spey SAC	✓	AS, SL
River Dee SAC	✓	AS
River South Esk SAC	✓	AS
River Tay SAC	-	AS, SL, BL, RL
River Tweed SAC	-	AS, SL, BL, RL

Note: [1]AS= Atlantic salmon (Salmo salar), SL= sea lamprey (Petromyzon marinus), BL= brook lamprey (Lampetra planeri), RL= river lamprey (Lampetra fluviatilis)

A6 Sites in waters of other member states

Offshore sites in adjacent states are listed in Table A.5 and A.6 below. Coastal sites in the Republic of Ireland and offshore sites in Germany and Netherlands are shown in Maps A.1, A.4, and A.6, and were considered in this screening assessment.

Table A.5: SPA sites in the adjacent waters of other Member States

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[35]
WEST OF SCOTLAND				
Inishtrahull SPA	474.45	Barnacle goose	Shag Common gull	N/A
Malin Head SPA	281.19	Corncrake	N/A	N/A
Tory Island SPA	571.01	Corncrake	Fulmar Razorbill Puffin	N/A
Trawbreaga Bay SPA	1549.83	Barnacle goose Brent goose Chough	N/A	Wetlands
Horn Head to Fanad Head SPA	2386.36	Barnacle goose Peregrine falcon Chough Greenland white-fronted goose	Fulmar Cormorant Shag Kittiwake Guillemot Razorbill	N/A
Fanad Head SPA	136.13	Corncrake	N/A	N/A
Inishbofin, Inishdooey and Inishbeg SPA	601.43	Barnacle goose Corncrake Arctic tern	Common gull Lesser black-backed gull	N/A
Greers Isle SPA	19.14	Sandwich tern	Black-headed gull Common gull	N/A

Table A.6: SAC sites in the adjacent waters of other Member States

Site Name	Area (ha)	Annex 1 Habitat	Annex II Species
WEST OF SCOTLAND			
South East Rockall Bank SAC	149318	Reefs	N/A
Inishtrahull SAC	471.23	Sea cliffs	N/A
Hempton's Turbot Bank SAC	4495.88	Sandbanks	N/A
Tory Island Coast SAC	3045.74	Coastal lagoons * Priority feature Reefs Vegetation of stony banks Sea cliffs	N/A

[35] A seabird assemblage of international importance: the area regularly supports at least 20,000 seabirds. Or, a wetland of international importance: the area regularly supports at least 20,000 waterfowl.

Site Name	Area (ha)	Annex 1 Habitat	Annex II Species
North Inishowen Coast SAC	7069.09	Mudflats and sandflats Vegetation of stony banks Sea cliffs Sand dunes Machairs (* in Ireland) Heaths	Narrow-mouthed whorl snail *Vertigo angustior* Otter *Lutra lutra*
Ballyhoorisky Point to Fanad Head SAC	1293.04	Vegetation of stony banks Sea cliffs Standing freshwater	Narrow-mouthed whorl snail *Vertigo angustior* Slender naiad *Najas flexilis*
Tranarossan and Melmore Lough SAC	653.63	Mudflats and sandflats Vegetation of drift lines Vegetation of stony banks Sea cliffs Coastal dunes Machairs (* in Ireland) Standing freshwater Heaths	Petalwort *Petalophyllum ralfsii*
Lough Nagreany Dunes SAC	221.15	Coastal dunes	Slender naiad *Najas flexilis*
Horn Head and Rinclevan SAC	2344.32	Coastal dunes Machairs (*in Ireland)	Geyer's whorl snail *Vertigo geyeri* Grey seal *Halichoerus grypus* Petalwort *Petalophyllum ralfsii* Slender naiad *Najas flexilis*
Mulroy Bay SAC	3209.14	Inlets and bays Reefs	Otter *Lutra lutra*
Sheephaven SAC	1841.98	Mudflats and sandlfats Salt meadows Sand dunes Machairs (* in Ireland) Forests	Petalwort *Petalophyllum ralfsii*
MID NORTH SEA HIGH			
Doggerbank SAC (Germany)	169,895	Sandbanks	Harbour porpoise *Phocoena phocoena* Harbour seal *Phoca vitulina*
Doggersbank SCI (Netherlands)	471,750	Sandbanks	Harbour porpoise *Phocoena phocoena* Harbour seal *Phoca vitulina* Grey seal *Halichoerus grypus*
Klaverbank SCI (Netherlands)	123,733	Reefs	Harbour porpoise *Phocoena phocoena* Harbour seal *Phoca vitulina* Grey seal *Halichoerus grypus*

A7 Ramsar sites

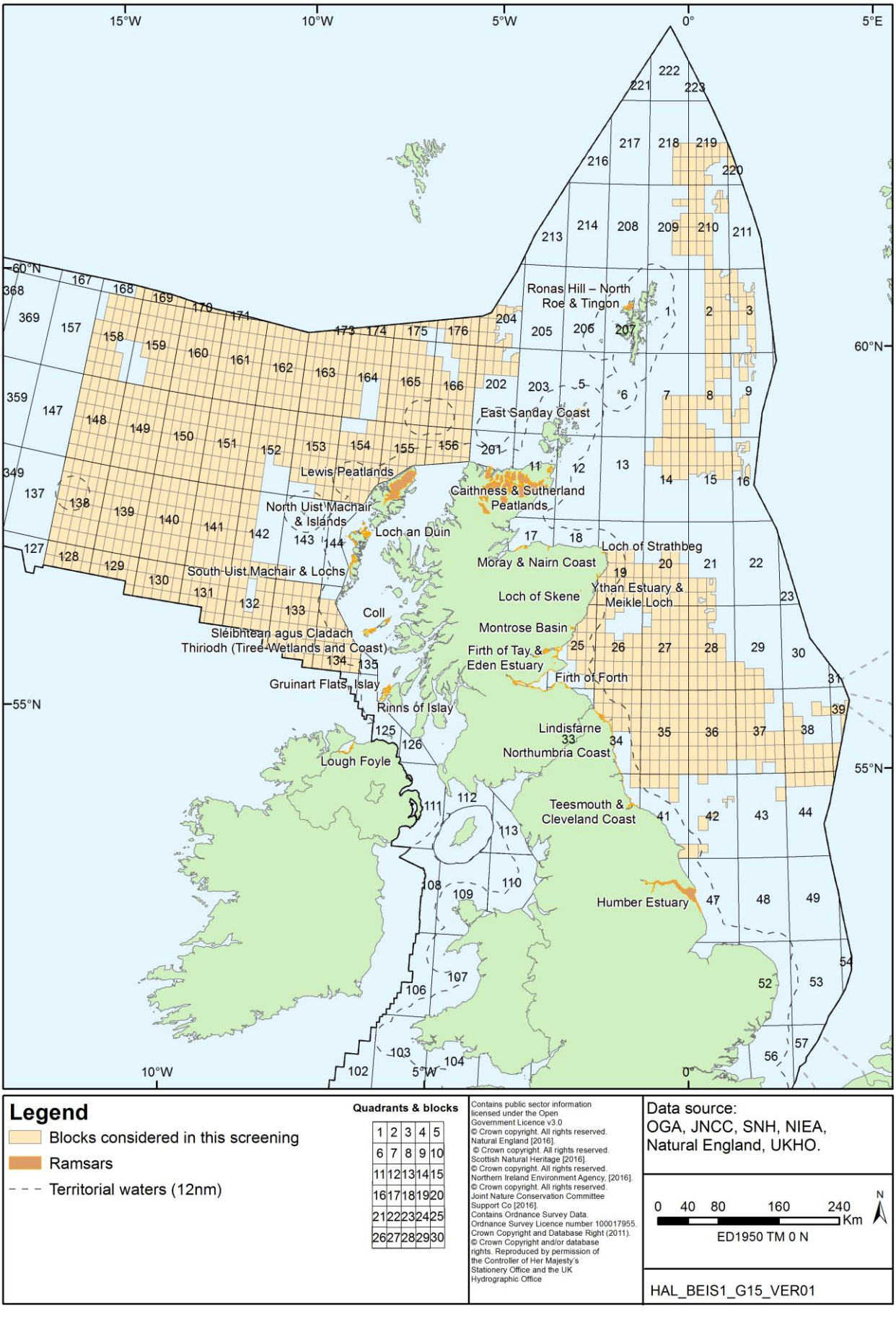
The coastal Ramsar sites listed in Table A.7 and shown on Map A.7 are also SPAs and/or SACs (although site boundaries are not always strictly coincident and a Ramsar site may comprise one or more Natura 2000 sites), see tabulation below.

Table A.7: Coastal Ramsar sites and corresponding Natura 2000 sites

Ramsar Name	SPA Name	SAC Name
WEST OF SCOTLAND		
Lewis Peatlands	Lewis Peatlands	Langavat
Caithness & Sutherland Peatlands	Caithness and Sutherland Peatlands	
Loch an Duin		Loch nam Madadh
North Uist Machair & Islands	North Uist Machair and Islands	North Uist Machair and Islands
South Uist Machair and Lochs	South Uist Machair and Lochs	South Uist Machair
Coll	Coll	
Tiree Wetlands & Coast	Tiree Wetlands & Coasts Tiree (corncrake)	Tiree Machair Loch a 'Phuill
Gruinart Flats, Islay	Gruinart Flats, Islay Rinns of Islay	Rinns of Islay
Rinns of Islay	Rinns of Islay	Glac na Criche Rinns of Islay
Lough Foyle	Lough Foyle	
NORTHERN NORTH SEA		
Ronas Hill – North Roe & Tingon	Ronas Hill – North Roe and Tingon	Ronas Hill – North Roe Tingon
East Sanday Coast	East Sanday Coast	Sanday
Caithness & Sutherland Peatlands	Caithness and Sutherland Peatlands	
MID NORTH SEA HIGH		
Moray and Nairn Coast	Moray and Nairn Coast	Culbin Bar Lower River Spey – Spey Bay Moray Firth River Spey
Loch of Strathbeg	Loch of Strathbeg	
Ythan Estuary and Meikle Loch	Ythan Estuary, Sands of Forvie and Meikle Loch	Sands of Forvie
Loch of Skene	Loch of Skene	
Montrose Basin	Montrose Basin	
Firth of Tay & Eden Estuary	Firth of Tay & Eden Estuary	Barry Links Firth of Tay & Eden Estuary
Cameron Reservoir	Cameron Reservoir	
Firth of Forth	Firth of Forth	
Lindisfarne	Lindisfarne Northumbria Coast	Berwickshire and North Northumberland Coast North Northumberland Dunes

Ramsar Name	SPA Name	SAC Name
Northumbria Coast	Northumbria Coast Teesmouth and Cleveland Coast	Berwickshire and North Northumberland Coast Durham Coast North Northumberland Dunes
Teesmouth and Cleveland Coast	Northumbria Coast Teesmouth and Cleveland Coast	Durham Coast
Humber Estuary	Humber Estuary	Humber Estuary Saltfleetby-Theddlethorpe Dunes and Gibraltar Point

Map A.7: Location of coastal Ramsar sites



Appendix B – Blocks and sites screened in

B1 Introduction

The following tables list those 29th Round Blocks and sites which have been screened in following application of the screening process described in Section 4. The Blocks and sites are listed according to the criteria by which they were screened in:

- Physical disturbance and drilling (Section 4.3, also see Figures 5.1 and 5.2)
- Underwater noise (Section 4.4, also see Figures 5.3 and 5.4)

These Blocks and sites will be subject to a second stage of HRA, Appropriate Assessment, before licensing decisions are taken.

B2 Physical disturbance and drilling

West of Scotland								
SPAs								
North Rona And Sula Sgeir SPA	155/4	155/5	165/24	165/25	165/29	165/30	166/21	166/22
	166/26	166/27	166/28					
Cape Wrath SPA	156/9	156/10	156/14	156/15				
Ness and Barvas, Lewis SPA	155/13	155/14	155/15	155/17	155/18	155/19		
Lewis Peatlands SPA	155/13	155/14	155/15	155/16	155/17	155/18	155/19	155/21
	155/22							
North Harris Mountains SPA	154/29	154/30						
West Coast of the Outer Hebrides pSPA	134/7	154/29	154/30					
Mingulay and Berneray SPA	134/6	134/7	134/8					
Coll and Tiree pSPA	134/19	134/20	134/24	134/25				
Flannan Isles SPA	154/16	154/17	154/18	154/19	154/21	154/22	154/23	154/24
	154/27	154/28						
Seas off St Kilda pSPA	152/19	152/20	153/11	153/12	153/13	153/14	153/15	153/16
	153/17	153/18	153/19	153/20	153/21	153/22	153/23	153/24
	153/25	153/29	153/30	154/16	154/21	154/22	154/23	154/26
	154/27	154/28						
SACs								
North Rona SAC	165/25	165/30	166/21	166/22	166/26	166/27		
Cape Wrath SAC	156/10	156/15						
North Harris SAC	154/29	154/30						
Loch Road Lagoons SAC	154/25	155/16	155/17	155/21	155/22			
Tràigh na Berie SAC	154/25	155/21						
East Mingulay SCI	134/7	134/8	134/13					
Wyville Thomson Ridge cSAC/SCI	164/2	164/3	164/4	164/5	164/10	165/1	165/2	165/3
	165/4	165/6	165/7	165/8	165/9	165/10	166/6	174/27
	174/28	174/29	174/30	175/21	175/22	175/26	175/27	175/28
Darwin Mounds SAC	164/2	164/3	164/4	164/5	164/6	164/7	164/8	164/9
	164/10	164/11	164/12	164/13	164/14	164/15	165/1	165/2
	165/6	165/7	165/11	165/12				
Solan Bank Reef cSAC/SCI	156/3	156/4	156/5	156/8	156/9	156/10	166/23	166/24
	166/25	166/28	166/29	166/30				
Stanton Banks SAC	133/14	133/15	133/18	133/19	133/20	133/23	133/24	133/25
	133/29	133/30	134/11	134/16	134/17	134/18	134/21	134/22
	134/23	134/24	134/26	134/27	134/28			
Anton Dohrn Seamount cSAC/SCI	140/7	140/8	140/9	140/10	140/12	140/13	140/14	140/15
	140/17	140/18	140/19	140/20	140/22	140/23	140/24	140/25

	140/28	140/29	140/30	141/6	141/7	141/8	141/11	141/12
	141/13	141/16	141/17	141/18	141/19	141/21	141/22	141/23
	141/26	141/27						
East Rockall Bank cSAC/SCI	128/1	128/2	128/3	128/4	128/5	128/6	128/7	128/8
	128/9	128/10	129/1	138/4	138/5	138/10	138/15	138/19
	138/20	138/23	138/24	138/25	138/27	138/28	138/29	138/30
	139/1	139/2	139/6	139/7	139/11	139/12	139/13	139/16
	139/17	139/18	139/21	139/22	139/26	139/27	148/6	148/11
	148/16	148/17	148/18	148/19	148/21	148/22	148/23	148/24
	148/25	148/27	148/28	148/29	148/30	149/21	149/26	149/27
North West Rockall Bank cSAC/SCI	138/1	138/2	138/3	138/4	138/5	138/6	138/7	138/8
	138/9	138/10	138/13	138/14	138/15	139/1	139/6	148/21
	148/22	148/23	148/26	148/27	148/28	148/29	148/30	
Northern North Sea								
SACs								
Braemar Pockmarks SAC	16/2a							
Mid North Sea High								
SPAs								
Buchan Ness to Collieston Coast SPA	19/11	19/12	19/13	19/16	19/17	19/18	19/21	19/22
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	19/16	19/17	19/21	19/22				
Ythan Estuary, Sands of Forvie and Meikle Loch (extension) pSPA	18/30	19/16	19/17	19/21	19/22	19/26		
Loch of Strathbeg SPA	19/11	19/12						
Fowlsheugh SPA	18/30	25/4	25/5	25/9	25/10	26/1		
Montrose Basin SPA	25/8	25/9	25/13	25/14				
Firth of Forth SPA	25/18							
Firth of Tay and Eden Estuary SPA	25/13	25/18						
Forth Islands SPA	25/24							
Outer Firth of Forth and St Andrews Bay Complex pSPA	25/13	25/14	25/18	25/19	25/20	25/24	25/25	25/30
	26/21	26/22	26/23	26/26	26/27	26/28	34/1	34/2
St Abb`s Head to Fast Castle SPA	25/30	34/1						
Lindisfarne SPA	34/6	34/7	34/8	34/12	34/13			
Farne Islands SPA	34/7	34/8	34/12	34/13				
Northumberland pSPA	34/1	34/6	34/7	34/8	34/9	34/12	34/13	34/14
	34/17	34/20	34/25					
Northumbria Coast SPA	34/1	34/6	34/7	34/8	34/12	34/13	34/17	40/5
Flamborough and Filey Coast pSPA	41/29a	41/29b	41/30	42/26				
Flamborough Head and Bempton Cliffs SPA	41/29a	41/29b	41/30	42/26				

Hornsea Mere SPA	41/29a	41/30						
Greater Wash pSPA	41/29a	41/30	42/26					
SACs								
Buchan Ness to Collieston SAC	19/12	19/16	19/17	19/21	19/22			
Sands of Forvie SAC	19/16	19/17	19/21	19/22				
River Dee SAC	18/30	19/21	19/26	25/5				
Garron Point SAC	18/30	25/4	25/5					
River South Esk SAC	25/8	25/9	25/13					
Barry Links SAC	25/13	25/18						
Firth of Tay and Eden Estuary SAC	25/13	25/18						
Isle of May SAC	25/24							
St Abb's Head to Fast Castle SAC	25/30	34/1						
Tweed Estuary SAC	34/1	34/6						
Berwickshire and North Northumberland Coast SAC	25/30	26/26	34/1	34/2	34/6	34/7	34/8	34/9
	34/12	34/13	34/14	34/17				
River Tweed SAC	34/1	34/6						
North Northumberland Dunes SAC	34/1	34/6	34/7	34/8	34/12	34/13	34/17	
Durham Coast SAC	40/5							
Flamborough Head SAC	41/29a	41/29b	41/30	42/26				
Dogger Bank cSAC/SCI	37/19	37/20	37/22	37/23	37/24	37/25	37/28b	37/29b
	37/30	38/16	38/17	38/21	38/22	38/23	38/24	38/25
	38/26	38/27	38/28	38/29	38/30	39/12	39/17	39/21
	39/26	43/10	44/1	44/2	44/3	44/4	44/5	45/1
Doggersbank SCI (Netherlands)	38/25	38/30	39/12	39/17	39/21	39/26	44/5	45/1
Southern North Sea pSAC	36/13	36/14	36/15	36/18	36/19	36/20	36/23	36/24
	36/25	36/29	37/11	37/12	37/16	37/17	37/18	37/19
	37/20	37/21	37/22	37/23	37/24	37/25	37/28b	37/29b
	37/30	38/21	38/26	38/27	42/10c	42/13b	42/14a	42/17
	42/26	42/27b	42/8a	42/9a	43/10	44/1	44/2	44/3

B3 Underwater noise

West of Scotland								
SPAs								
Cape Wrath SPA	156/9	156/10	156/14	156/15				
Mingulay and Berneray SPA	134/6	134/7	134/8	134/11	134/12	134/13		
Coll and Tiree pSPA	134/14	134/18	134/19	134/20	134/23	134/24	134/25	
West Coast of the Outer Hebrides pSPA	134/6	134/7	154/24	154/25	154/29	154/30		
Flannan Isles SPA	154/16	154/17	154/18	154/19	154/21	154/22	154/23	154/24
	154/26	154/27	154/28	154/29				
Seas off St Kilda pSPA	152/15	152/19	152/20	153/11	153/12	153/13	153/14	153/15
	153/16	153/17	153/18	153/19	153/20	153/21	153/22	153/23
	153/24	153/25	153/29	153/30	154/16	154/21	154/22	154/23
	154/24	154/26	154/27	154/28	154/29			
St Kilda SPA	153/29							
SACs								
North Rona SAC	156/1	156/2	165/25	165/30	166/21	166/22	166/23	166/26
	166/27	166/28						
Durness SAC	156/10	156/15						
North Harris SAC	154/29	154/30						
Mid North Sea High								
SPAs								
Buchan Ness to Collieston Coast SPA	19/11	19/12	19/13	19/16	19/17	19/18	19/21	19/22
	19/23							
Fowlsheugh SPA	18/30	19/26	25/4	25/5	25/9	25/10	26/1	26/6
Forth Islands SPA	25/18	25/24						
Outer Firth of Forth and St Andrews Bay Complex pSPA	25/8	25/9	25/13	25/14	25/18	25/19	25/20	25/24
	25/25	25/30	26/16	26/17	26/21	26/22	26/23	26/26
	26/27	26/28	34/1	34/2	34/6			
Farne Islands SPA	34/6	34/7	34/8	34/9	34/12	34/13	34/14	34/17
Northumberland pSPA	34/1	34/2	34/3	34/4	34/6	34/7	34/8	34/9
	34/12	34/13	34/14	34/15	34/17	34/20	34/25	
Flamborough and Filey Coast pSPA	41/29a	41/29b	41/30	42/26				
Flamborough Head and Bempton Cliffs SPA	41/29a	41/29b	41/30	42/26				
SACs								
River Dee SAC	18/30	19/21	19/26	25/5				
River South Esk SAC	25/8	25/9	25/13	25/14				
Firth of Tay and Eden Estuary SAC	25/13	25/18						
Isle of May SAC	25/18	25/24						

River Tweed SAC	34/1	34/6	34/7	34/12				
Tweed Estuary SAC	34/1	34/2	34/6	34/7				
Berwickshire and North Northumberland Coast SAC	25/30	26/26	34/1	34/2	34/3	34/6	34/7	34/8
	34/9	34/12	34/13	34/14	34/17			
Doggersbank SCI (Netherlands)	38/25	38/30	39/12	39/17	39/21	39/26	44/4	44/5
	45/1							
Southern North Sea pSAC	36/13	36/14	36/15	36/18	36/19	36/20	36/23	36/24
	36/25	36/29	37/11	37/12	37/13	37/16	37/17	37/18
	37/19	37/20	37/21	37/22	37/23	37/24	37/25	37/28b
	37/29b	37/30	38/16	38/21	38/22	38/26	38/27	42/10c
	42/13b	42/14a	42/17	42/26	42/27b	42/8a	42/9a	43/10
	44/1	44/2	44/3					

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