Department of Energy & Climate Change

Offshore Oil & Gas Licensing 28th Seaward Round

Habitats Regulations Assessment
Stage 1 – Block and Site Screenings

October 2014

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1 Introduction

1.1 Background and overview of plan

On 24th January 2014, the Secretary of State for the Department of Energy and Climate Change (DECC) invited applications for licences in the 28th Seaward Licensing Round. Applications for Traditional Seaward, Frontier Seaward and Promote Licences covering over 360 Blocks/part Blocks have been received.

The draft plan covering future seaward licensing had previously been subject to a Strategic Environmental Assessment (SEA), completed in October 2011. 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 a 3 month public consultation period, and a post-consultation report summarising and responding to feedback received has been produced as an input to DECC licensing decisions.

The exclusive rights to search and bore for petroleum in Great Britain, 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* gives the Secretary of State for Energy and Climate Change 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. The award of a licence under the *Petroleum Act 1998* does not confer an automatic right to conduct any offshore activities, which 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 waters; for all activities in offshore waters this is by the *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007* (as amended). Additionally 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 DECC plan is 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 is undertaking a Habitats Regulations Assessment (HRA).

In this HRA, the Department has applied the Habitats Directive test (elucidated by the European Court of Justice in the case of Waddenzee (Case C-127/02)[1]) 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 applied for in the 28th Round is likely to have a significant effect on a relevant site, either individually or in combination 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; SEERAD 2000), SNH (2010, 2012), Tyldesley (2012), the National Planning Policy Framework (DCLG 2012[2]) 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 sites with marine features or with a marine ecological linkage such as anadromous and catadromous fish). These sites are screened for the likelihood of significant effects based on the nature and scale of potential effects. 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 applied for, 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 the conservation objectives for the various interest features (see Section 3 and Appendix A)
- Description of the screening assessment process used to identify likely significant effects on relevant European sites (see Section 4)
- The screening assessment including a consideration of cumulative and in-combination effects (see Section 5)

[1] 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.

[2] Which states that "listed or proposed Ramsar sites", should receive the same protection as European sites

- 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, DECC has consulted with the Joint Nature Conservation Committee (JNCC), Natural England, Scottish Natural Heritage (SNH), Natural Resources Wales (NRW) and the Northern Ireland Environment Agency (NIEA) on a draft of this screening assessment. The screening assessment has been amended in light of some comments received from these Statutory Nature Conservation Bodies (SNCBs).

2 Blocks applied for and potential activities

2.1 Blocks applied for

Offshore Blocks for which applications have been made during the 28th Seaward Licensing Round and which are considered in this screening assessment are listed in Table 2.1 and shown on Figures 2.1 and 2.2. Note that the majority of these Blocks have been licensed previously.

2.2 Licensing

The exclusive rights to search and bore for and get petroleum in Great Britain, 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 Secretary of State 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 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.

There are three types of Seaward Production Licences:

- Traditional Production Licences are the standard type of Seaward Production Licences and run for three successive periods or Terms. Each Licence expires automatically at the end of each Term, unless the licensee has made enough progress to earn the chance to move into the next Term. The Initial Term lasts for four years and the Licence will only continue into a Second Term of four years if the agreed Work Programme has been completed and if 50% of the acreage has been relinquished. The Licence will only continue into a Third Term of 18 years if a development plan has been approved, and all the acreage outside that development has been relinquished. DECC at its discretion can offer different term lengths if an applicant makes a strong enough case, for instance where a high pressure high temperature (HPHT) prospect will take longer to plan and explore. In such cases the initial and/or second terms may be extended to six years.

- Frontier Production Licences are a variation of the Traditional Production Licence with longer terms. A Frontier Production Licence has a longer Initial Term (six years as opposed to four) with the objective of allowing companies to screen larger areas. After 3 years, the licensee must relinquish 75% of the licensed acreage. At the end of the Initial Term, the exploration Work Programme must have been completed and the licensee must relinquish 50% of what is left (i.e. leaving one eighth of the original licensed area). A variation on the Frontier Production Licence was introduced prior to the 26th Round. Designed for the particularly harsh West of Scotland environment, it is similar to the existing Frontier Licence but with an initial term of nine years with a Drill-or-Drop decision

to be made by the end of the sixth year and (if the licensee chooses to drill) drilling to be completed within the remaining three years of the initial term.

- In the 21st Round (2002) the Department introduced Promote Licences. The general concept of the Promote Licence is that the licensee is given two years after award to attract the technical, environmental and financial capacity to complete an agreed Work Programme. In effect, DECC will defer (not waive) its financial, technical and environmental checks until the preset Check Point. Promote licensees are not allowed to carry out field operations until they have met the full competence criteria. The way this is implemented is that each Promote Licence carries a "Drill-or-Drop" Initial Term Work Programme. The Licence will therefore expire after two years if the licensee has not made a firm commitment to DECC to complete the Work Programme (e.g. to drill a well). By the same point, it must also have satisfied DECC of its technical, environmental and financial capacity to do so. A Promote licensee cannot pursue activity permitting or undertake operations until they have continued to the second phase of the initial term. Thus for the purposes of this screening assessment, it is concluded that likely significant effects on European sites cannot occur from the award of Promote licences and that such Blocks can be screened out at this stage. The Blocks for which Promote licence applications are being considered are listed in Table 2.1 and illustrated in Figure 2.2. The Department will undertake HRA for the potential for likely significant effects on European sites in advance of decisions being taken on whether any of these 28th Round Promote licences should proceed to a second term when field operations could be carried out.

The model clauses, and terms and conditions which are attached to Licences are contained in Regulations. It is noted that the environmental management capacity and track record of applicants is considered by DECC, through written submissions and interviews, before licences are awarded.

2.3 Activity

As part of the licence application process, applicant companies provide DECC with details of work programmes they propose in the first term to further the understanding or exploration of the Blocks(s) in question. These work programmes are considered with a range of other factors in DECC'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 Secretary of State to drill a well. Applicants are required to make firm drilling commitments on the basis that, if there were no such commitment, the Secretary of State 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 environmental assessments.

- A **Contingent Drilling Commitment** is also a commitment to the Secretary of State to drill a well, but it includes specific provision for DECC 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, discussed above, 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.

Table 2.1: List of Blocks applied for in the 28th Seaward Licensing Round

Traditional Licence Applications

2/15b	12/30	16/2a	21/2b	23/16h	37/15	42/30c	49/28e	204/24b	210/30c
3/1b	13/16b	16/8c	21/6a	23/16i	37/21	43/1	103/2	204/23a	211/1
3/11a	13/17	16/12e	21/7b	28/24	37/26	43/2	103/3	204/25c	211/2
3/22	13/21c	16/22c	21/8b	28/25	37/27	43/6	106/13	204/30b	211/3
3/26	13/30b	16/23b	21/11	29/4e	38/1	43/19b	106/14	205/4a	211/6
3/27a	14/21	16/24c	21/14b	29/8c	38/7	43/20c	106/15	205/5b	211/7b
3/30	14/22	18/1	21/16	29/9b	38/8	43/22b	106/18	205/9	211/13c
4/26	14/25	18/2	21/17d	29/10d	38/13	43/23	106/19	205/10	211/16d
8/9	14/26b	18/4	21/18b	29/15b	38/14	44/17e	106/20	205/13	211/18c
8/10	14/27	18/5	21/19c	29/21	38/15	44/18c	106/22	205/19b	213/19a
8/14	14/29c	18/9	21/20b	30/1b	38/18	44/27	106/23	205/26d	213/20c
8/15b	15/4	19/15	21/24b	30/7c	38/19	47/5e	106/24	206/5	213/23
8/23	15/5	20/2b	21/25c	30/17e	38/20	47/9d	106/26	206/16b	213/24
8/29	15/11	20/3c	21/28b	30/18b	39/11	47/14e	106/27	206/17	213/25b
8/30	15/16d	20/4a	21/29c	30/19b	39/16	48/1b	106/28	206/21	214/16b
9/2c	15/18b	20/5b	22/1	30/20	41/1	48/2b	106/29	207/1b	214/18b
9/5	15/19e	20/6b	22/5c	30/23	41/2	48/3	107/11	210/3	214/19
9/6	15/20d	20/7b	22/15a	30/29	42/6	48/4a	107/16	210/4b	214/21b
9/11e	15/23b	20/7c	22/18c	30/30	42/10b	48/8b	110/12b	210/5c	219/29
9/11f	15/24a	20/8	22/19d	35/26	42/11	48/12g	110/13c	210/8	219/30
9/16	15/25d	20/9	22/19e	35/27	42/12b	48/16	110/13e	210/9b	220/26
9/28b	15/27b	20/11	22/21c	37/5	42/19	49/3	110/14b	210/19	220/27
10/1	15/29e	20/12	22/22b	37/9	42/20b	49/4d	110/15b	210/20a	
12/21d	15/30b	20/15	22/26d	37/10	42/28c	49/9d	110/17	210/24c	
12/26c	16/1b	21/1d	23/11d	37/14	42/29c	49/13	110/18b	210/29b	

Frontier Licence Applications

154/1	158/20	159/21	164/18	164/28	166/2	175/29	204/29a		
154/2	158/25	159/22	164/19	164/29	166/7	175/30	219/25		
154/3	158/30	159/26	164/23	165/5	166/8	176/26			
158/19	159/16	159/27	164/24	166/1	166/13	204/28d			

Promote Licence Applications

8/22	13/19	20/10	26/5	30/22	41/15	43/7	47/6	52/4b	56/28
8/24	13/20	21/12b	26/7	30/24a	41/20	43/8	47/10d	52/5b	98/7b
11/24b	13/23c	21/13b	26/8	30/25a	42/1	43/9	48/22c	54/11b	98/8a
12/19b	14/17	21/27a	26/9	34/28	42/14b	43/11	48/28b	54/16	98/12
12/20b	14/18f	22/3	26/10	34/29	42/15b	44/7	49/25b	54/1a	113/28b
12/23	14/23b	22/8b	26/13	37/28	42/16	44/8	49/29c	54/6b	113/29b
12/29	14/30b	23/26c	27/1	37/29	43/3	44/9	49/30b	56/22	211/11a
13/14	15/19b	26/3	27/6	41/5	43/5	44/10	50/26a	56/23	
13/15	15/26d	26/4	28/2a	41/10	43/4	47/5e	52/3a	56/27	

Figure 2.1: Location of Blocks applied for in the context of existing licences

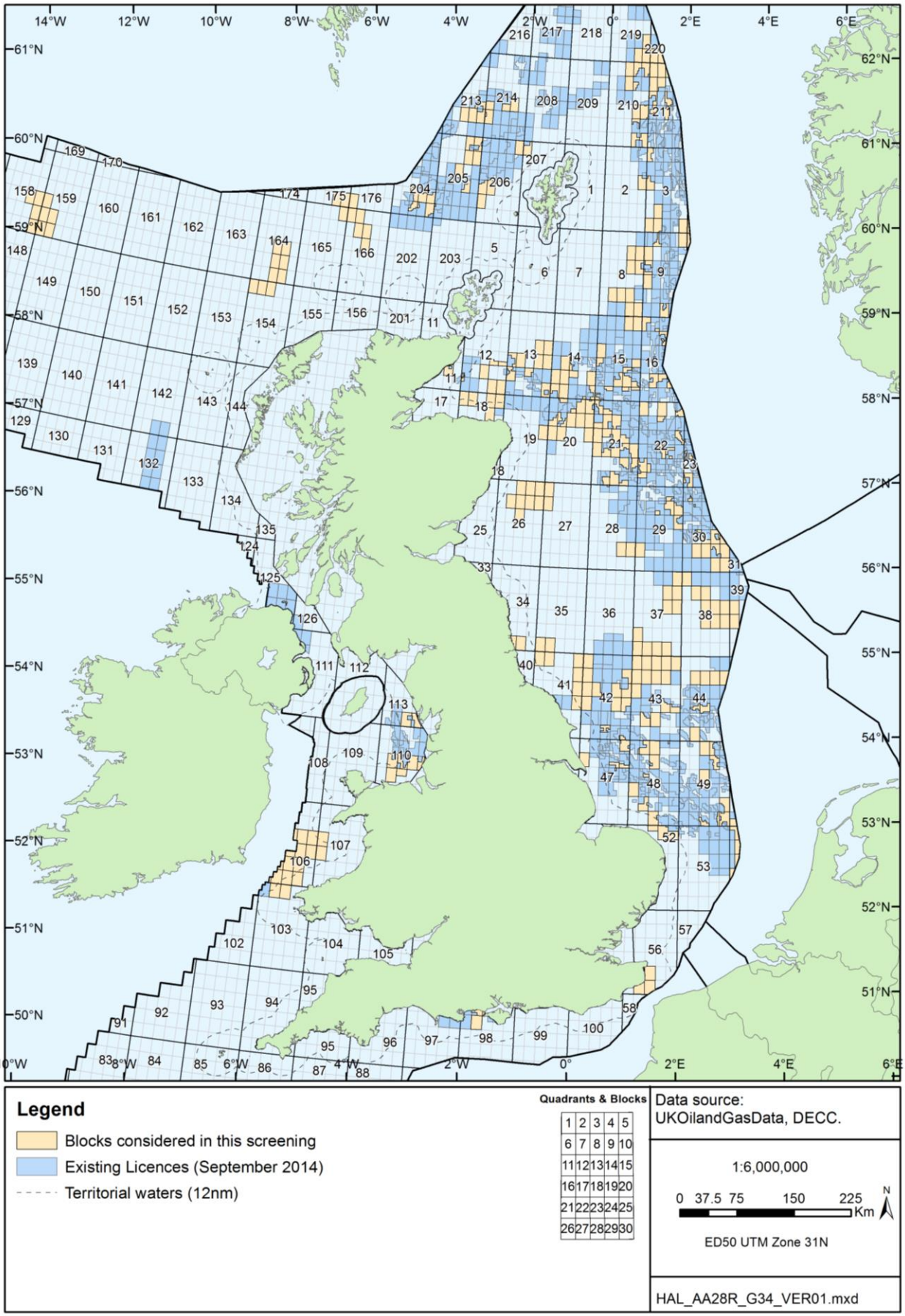
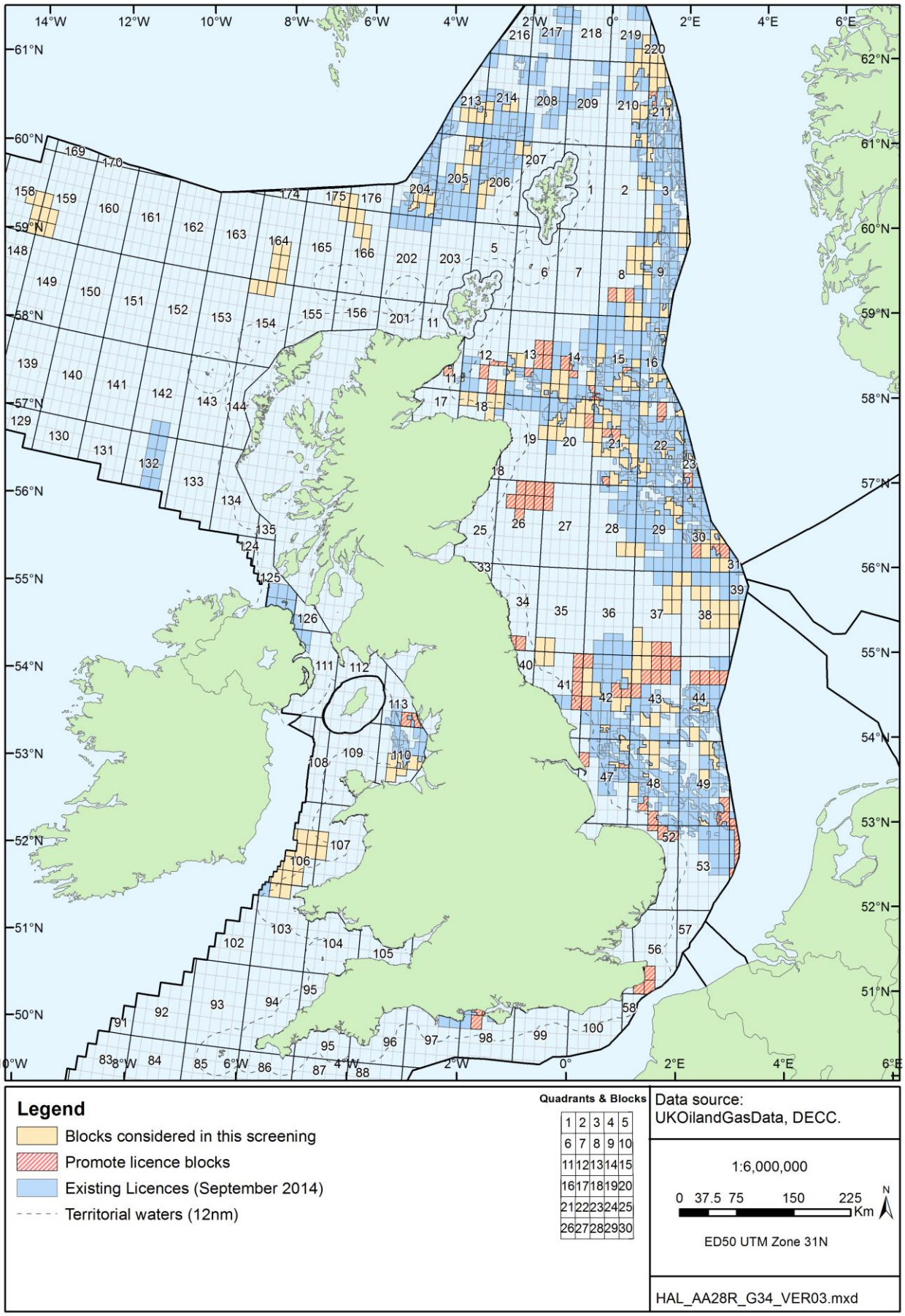


Figure 2.2: Blocks applied for with Promote licence applications distinguished

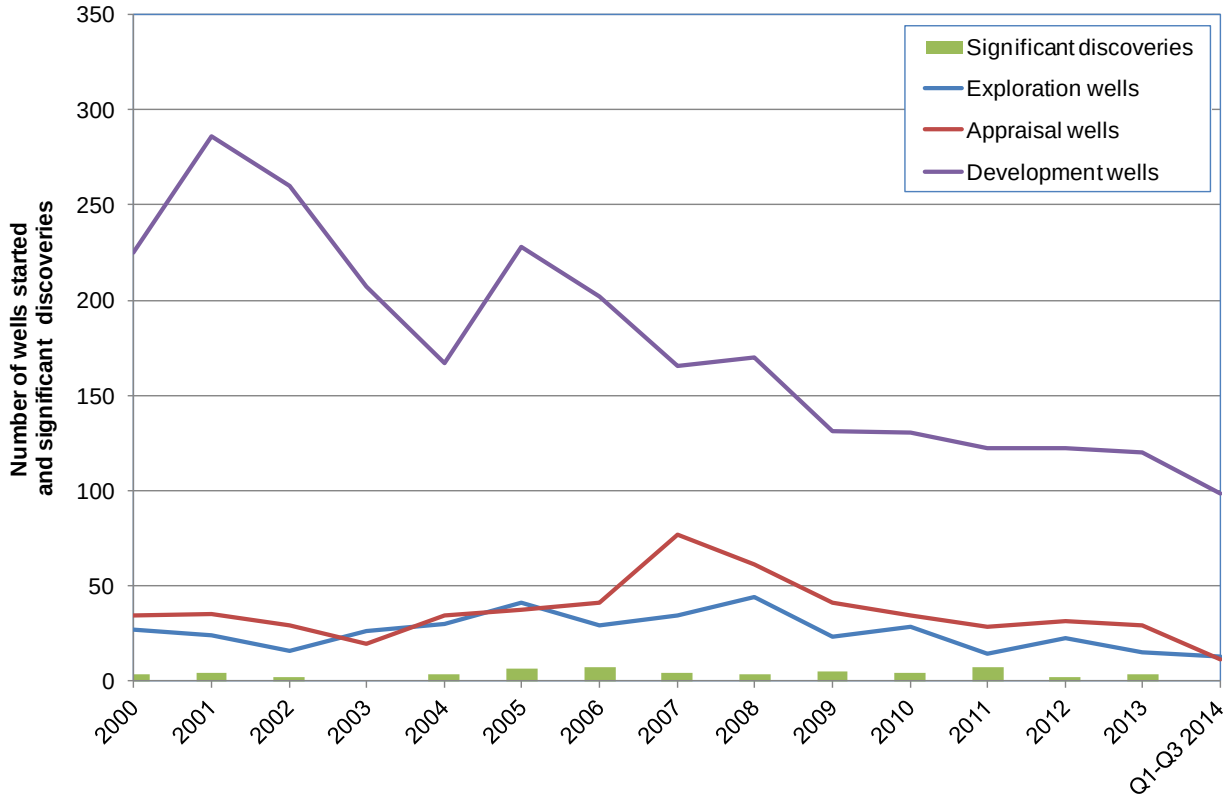


It is made clear in the application guidance that a Production Licence does not allow a licensee to carry out all petroleum-related activities from then on (this includes those activities outlined in initial work programmes). Activities in the field (see Table 2.2) associated with seismic survey or drilling, are subject to further individual controls by DECC, and a licensee also remains subject to controls by other 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 first four-year period (six years in the case of Frontier licences and some Traditional licences) are detailed in the licence applications. For some activities, such as seismic survey noise, and accidental events such as oil spills, 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.

On past experience, less activity actually takes place 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 half less than half again will yield an amount significant enough to warrant development. Depending on the expected size of finds, there may be further drilling to appraise the hydrocarbons (appraisal wells). For context, Figure 2.3 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).

Figure 2.3: 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: DECC Drilling Activity, Significant Offshore Discoveries (January 2014)

Discoveries that are developed may require further drilling, wellhead infrastructure, pipelines and possibly production facilities such as platforms, although recent developments are mostly tiebacks to existing production facilities rather than stand alone developments. For example, of the 68 current projects identified by DECC's Project Pathfinder (as of 3rd October 2014)[3], 36 are planned as subsea tie-backs to existing infrastructure. The final form of development for many of the remaining projects is not decided but some are likely to be subsea tie-backs. The nature, extent and timescale of development, if any, which may ultimately result from the licensing of these Blocks is therefore uncertain. However, Figure 2.3 indicates that the number of development wells has declined over time and this pattern is likely 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 28th Round Blocks. It is therefore 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. In this way the opinion of the Advocate General in ECJ (European Court of Justice) case C-6/04, 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.

For the purposes of this screening assessment, the implications of geophysical survey and drilling are considered in a generic way for all the Blocks applied for; 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 applied for.
- The potential acoustic disturbance effects associated with undertaking a deep geological seismic survey within each Block applied for (as well as undertaking other smaller seismic operations including rig site survey and Vertical Seismic Profiling).
- Accidental oil spill effects[4] associated with the drilling of an exploration well within each Block applied for.
- The potential for cumulative and in-combination effects.

Subsequent Appropriate Assessment (AA) of sites for which a likely significant effect cannot currently be excluded will consider the specific work programmes for the initial term agreed with the Department as part of the Block licence application process.

[3] DECC Project Pathfinder: https://itportal.decc.gov.uk/eng/fox/path/PATH_REPORTS/pdf
[4] These are not planned events.

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. 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 50m apart) can be achieved by a single sail line. 3D survey airgun arrays are normally larger – arrays can be several thousand cubic inches in volume[5] with typical broadband source levels of 248-259db re 1µPa (Richardson *et al*. 1995). Seismic survey duration depends on area and objectives, and may last a few hours, to several weeks (DECC 2011a).
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 small airgun and shorter hydrophone streamer is used (with source size of 40-400 cubic inches5). The survey typically covers 2km or 3km square. 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 of up to ~500 cubic inches5) 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.

[5] OGP 2011 – An overview of marine seismic operations.

Potential activity	Description
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 1.5kmin 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[6] 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[7]), 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 designations, the Scottish Government has indicated that it intends to consult on the creation of 14 marine SPA sites which are currently at the draft (dSPA) stage – see Appendix A. The sites are only subject to policy protection on ministerial approval to formally consult on them (expected in 2015). Natural England is currently engaging in informal dialogue on draft SPA proposals which are also expected to be subject to public consultation in 2015, but definitive site boundaries are presently not available. The proposals include the Greater Wash SPA with red throated diver and common scoter as draft features, and also the Solent to Dorset Coast SPA (which is an extension to the Solent SPA) for breeding common, sandwich and little terns. The above sites and draft features have been included in the screening in their current form as they are likely to be subject to consultation within the 28th Round licensing timetable.

Should further sites be 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[8] (version as of 1st September 2014) and SPA[9][10] (version as of 1st September 2014) summary data and interest features and site characteristics were

[6] Based on knowledge of potential sources of effect resulting from the activities (from previous DECC AAs and SEAs), and pathways by which these effects may impact receptors present on the site (from previous DECC AAs and SEAs, Regulation 33/35 advice and literature sources etc).
[7] Which states that "listed or proposed Ramsar sites should be given the same protection as European sites." UK coastal Ramsar sites are typically coincident with SACs and/or SPAs.
[8] Version as of 1st September 2014 - http://jncc.defra.gov.uk/page-1461
[9] Version as of 1st September 2014 - http://jncc.defra.gov.uk/page-1409
[10] http://www.snh.gov.uk/docs/A1350044.pdf - 22nd July 2014

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)[11], Natural England[12], Natural Resources Wales (NRW)[13] and Department of Environment Northern Ireland (DoENI)[14]. 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)[15]
- Riverine Natura 2000 sites designated for migratory fish and/or the freshwater pearl mussel
- Natura 2000 sites designated for breeding red-throated divers

A number of Natura 2000 sites are designated for mobile species (seabirds and marine mammals) which may be present beyond site boundaries. These are considered in Section 4.6.

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 applied for and sites together with site details can be found in Appendix A.

[11] http://gateway.snh.gov.uk/sitelink/index.jsp
[12] http://www.naturalengland.org.uk/ourwork/conservation/designations/default.aspx
[13] http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/designated-sites-search.aspx
[14] http://www.doeni.gov.uk/niea/protected_areas_home/natura_2000.htm
[15] http://jncc.defra.gov.uk/protectedsites/sacselection/SAC_list.asp?Country=OF

Figure 3.1: SPAs included in the screening process

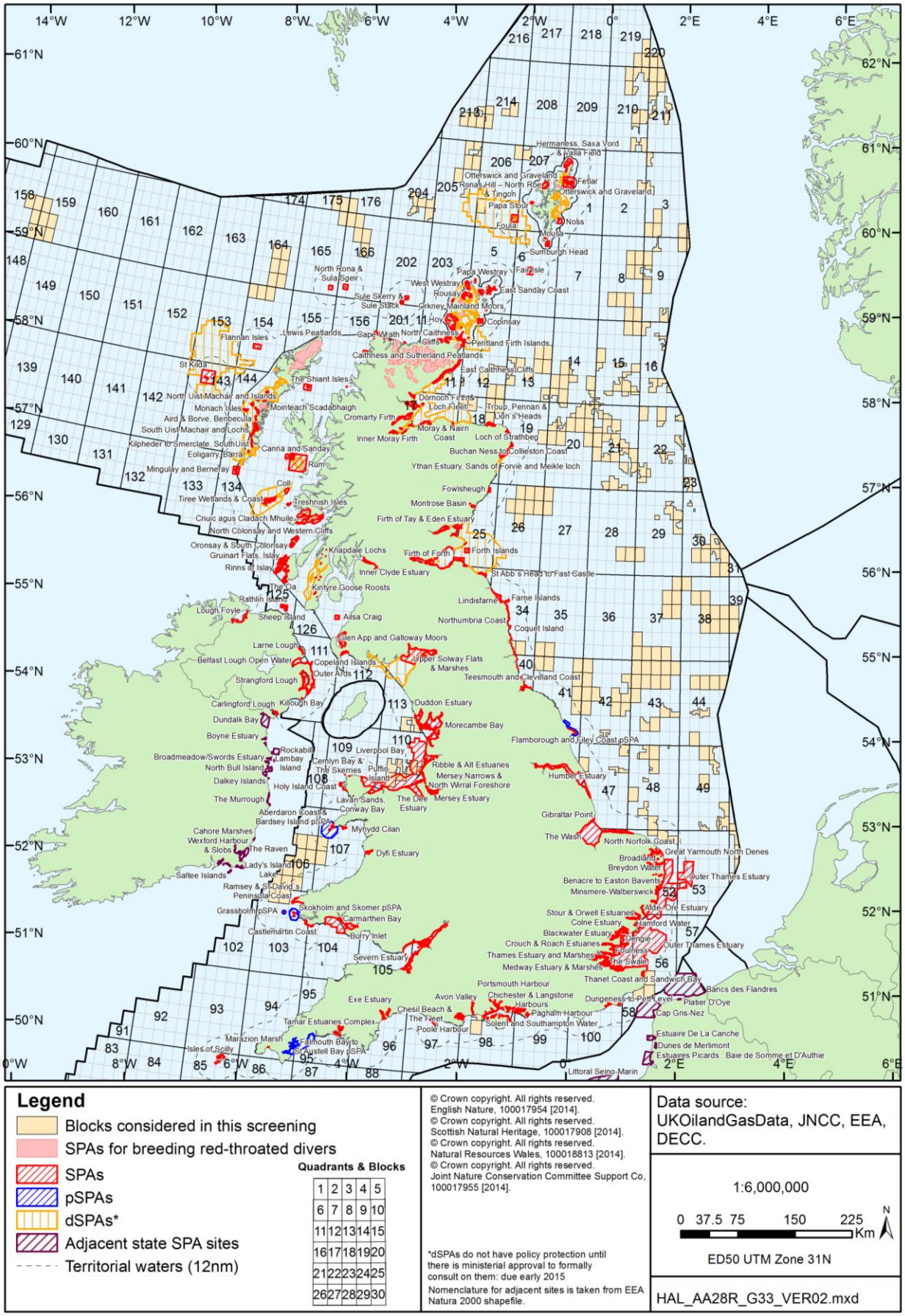
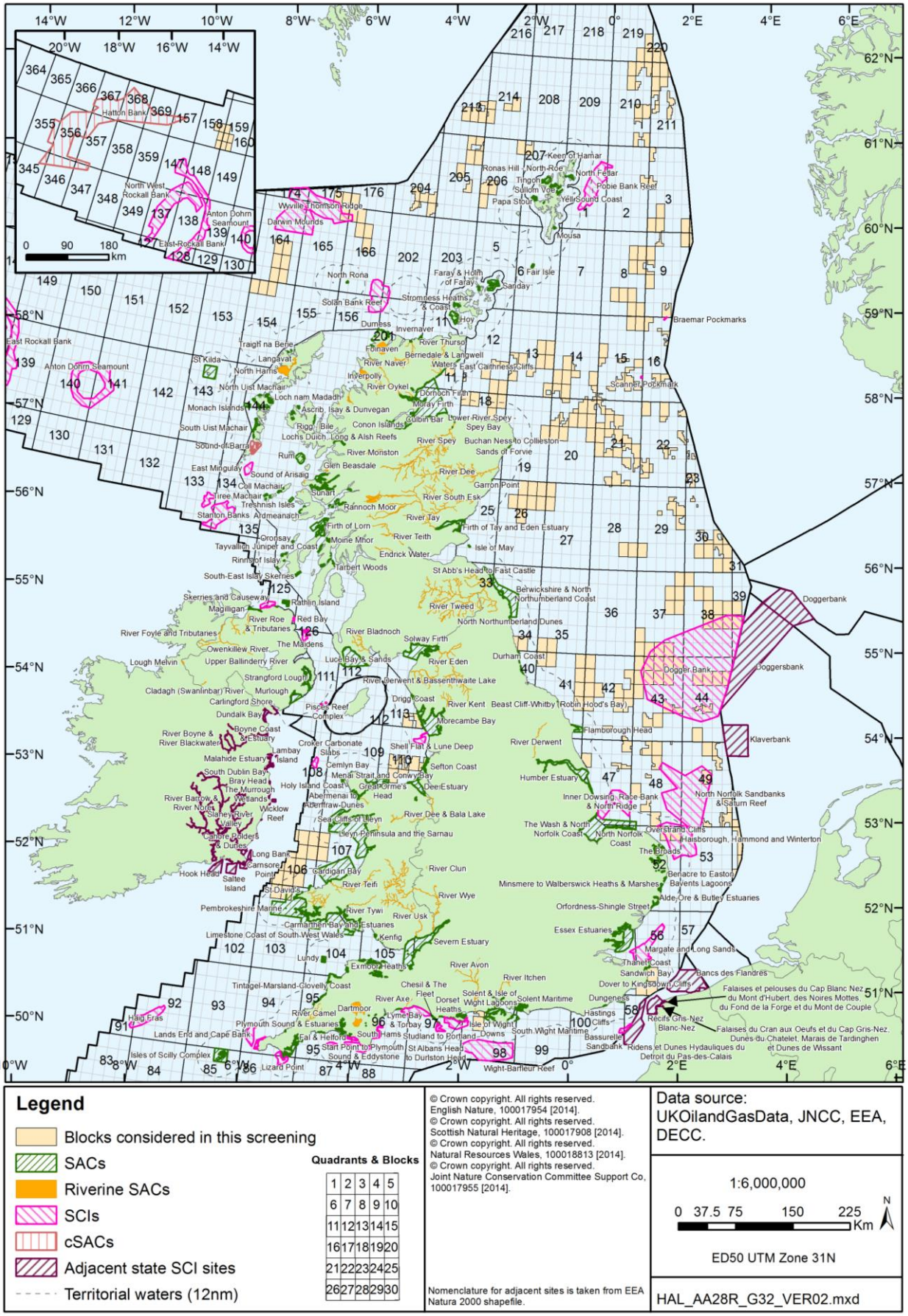


Figure 3.2: SACs included in the screening process



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 applied for in the 28th 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 applied for, 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 and marine mammals) to be present beyond relevant sites, 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 applied for, in combination with other marine activity plans – see Section 5.
- Conclusions. 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 licensing decisions are taken – see Section 6.

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 Traditional or Frontier Licence awarded 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 effects, legal and other controls are extensively described in previous DECC SEA Environmental and Technical Reports and are not duplicated in detail here.

Subsequent 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.

Use has been made of advice prepared by the conservation agencies under the various Habitats Regulations, since this typically includes advice on operations that may cause deterioration or disturbance to relevant features or species. The Regulation 33 Advice (now Regulation 35 under the *Conservation of Habitats and Species Regulations 2010*) includes an activities/factors matrix derived from Marlin (www.marlin.ac.uk) where applicable. However, it is noted that several of the "probable" effects highlighted in the matrices are not inevitable consequences of oil and gas exploration and production since they can be mitigated through timing, siting or technology (or a combination of these). The Department expects that these options would be evaluated by an operator and documented in the environmental assessments required as part of activity consenting.

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 DECC Strategic Environmental Assessments, and operator 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
- Accidental spills
- Cumulative and in-combination effects

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). 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 DECC's decision with regards to the application.

Source of effect	High level controls
	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 2011a, Appendices 4 and 5), and oil and other contaminant concentrations in the major 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 oil outside of regulatory standards or permit conditions constituting an offence. These 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.
Acoustic disturbance	Seismic operators are required to submit an application for consent to carry out a geological survey. As part of the application process, operators 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 consents 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. DECC will take account of the advice provided by the relevant statutory nature conservation body in determining any consent conditions. Potential disturbance of certain species may be avoided by the seasonal timing of noisy activities, and periods of seasonal concern for individual Blocks on offer have been highlighted (see Section 2 of DECC's Other Regulatory Issues[16] which accompanied the 28th Round offer) for which licensees should expect to affect DECC's decision whether or not to approve particular activities.
Oil spills	Oil Pollution Emergency Plans (OPEPs): regulatory requirements on operators to prepare spill prevention and containment measures, risk assessment and contingency planning – these are reviewed by DECC, Maritime and Coastguard Agency (MCA), JNCC and other relevant organisations. Additional conditions may be imposed by DECC through block-specific licence conditions (i.e. "Essential Elements"), and seasonal periods of concern for drilling, within which there is a presumption for drilling activity to be refused unless appropriate further mitigation measures can be agreed which are defined at the project level. MCA is responsible for a National Contingency Plan and maintains a contractual arrangement for provision of aerial spraying, with aircraft based at Birmingham

[16] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/283487/28R_other_reg_issues.pdf

Source of effect	High level controls
	International and East Midlands airports, and counter-pollution equipment (booms, adsorbents etc.). The UK Government announced in 2012 that an Emergency Towing Vessel for the waters around the Northern and Western Isles will be stationed in Orkney up to 2015[17]. The government has also been in discussions with the oil industry on the potential of a commercial call-out arrangement to use their vessels and BP have agreed to volunteer a vessel to help in an emergency should the MCA deem it appropriate[18].

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 activities are:

- **Anchoring of semi-submersible rigs**. Semi-submersible rigs use anchors to hold position, typically between 8 and 12 in number at a radius depending on the 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 North Sea depths, rig anchors extend to a radius of up to *ca.* 1,500m. 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 dynamically positioned (DP) drill ships rather than anchored semi-submersible rigs are typically used; semi-submersible rigs are typically not used in water depths of less than 120m. For the purposes of this screening assessment, physical disturbance of the seabed to a maximum distance of 3km from a rig has been assumed.

- **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 seabed, material such as grout bags or rocks may be placed on the seabed to stabilise the rig feet. 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. 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 (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

[17] https://www.gov.uk/government/news/uk-government-announces-tug-funding-for-scotland
[18] https://www.gov.uk/government/news/moore-welcomes-bp-and-north-star-support-for-second-support-vessel

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 by OESEA and OESEA2 (DECC 2009 and 2011, respectively).

In contrast to historic oil based mud discharges[19], 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 close to the drilling location (<500m) is often detectable chemically (see e.g. Daan & Mulder 1996). 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.

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).

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

[19] 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.

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. 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 windfarm (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.

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 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). 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.

Since 2008, a number of dead seals (>76 animals) displaying corkscrew injuries (Bexton *et al.* 2012) have been found primarily on beaches in eastern Scotland, North Norfolk coast and Strangford Lough (Thompson *et al.* 2010). The injuries are consistent with those that might be expected if the seals had been drawn through a ducted propeller or some types of Azimuth thruster (widely used in marine industry vessels (SNCB 2012).

While research is undertaken, interim advice by the SNCBs sets out recommendations for regulators and industry with regards to understanding and minimising the risk of corkscrew injury to seals (SNCB 2012). For high risk areas, defined as within 4 nautical miles (*ca*. 7km) of a harbour seal SAC and areas where the harbour seal population is in significant decline, SNCB advice is to consider alternatives to using ducted propellers or avoid the breeding season (1st June-31st August). If these measures are not possible then a Seal Corkscrew Injury Monitoring Scheme should be considered. Guidance for medium risk areas (activity proposed to take place between 4 and 30nm (44.6km) of a harbour seal SAC or within 4 nm of a grey seal SAC) is similar with the grey seal breeding season identified as 1st October-31st December. Activities proposed to take place beyond 30nm from a harbour seal SAC and 4nm from a grey seal SAC are regarded as having a low risk and no mitigation measures are proposed. Blocks within the medium risk areas would be screened in through the application of the oil spill criteria (see Section 4.5).

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 5.3 (SPAs) and 5.4 (SACs).

4.4 Underwater noise

4.4.1 Noise sources and propagation

Potential effects of anthropogenic noise on receptor organisms range from acute trauma to subtle behavioural and indirect ecological effects, for example on prey species, complicating the assessment of significant effects. The sources, measurement, propagation, ecological effects and potential mitigation of noise associated with hydrocarbon exploration and production have been extensively reviewed and assessed in successive Offshore Energy SEAs (see DECC 2009, 2011a). Of those activities which could follow licensing, deep geological seismic survey is of primary concern for noise effects (Table 2.2). 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 than those resulting from a deep geological seismic survey.

4.4.2 Effects thresholds

Marine mammals are regarded as the most sensitive to acoustic disturbance. This is due to their use of acoustics for echolocation and vocal communication and their possession of lungs which are sensitive to rapid pressure changes. Most concern in relation to seismic noise disturbance has been related to cetacean species. However, some pinnipeds are known to vocalise at low frequencies (100-300Hz) (Richardson *et al*. 1995), suggesting that they have good low frequency hearing and are therefore sensitive to acoustic disturbance.

Based on the criteria developed by Southall *et al*. (2007), and the data reported by Lucke *et al*. (2009)[20], indicative spatial ranges of injury and disturbance for cetaceans and pinnipeds may be calculated as indicated in Table 4.2 below. Calculated ranges for the Southall *et al*. (2007) criteria suggest that there is negligible risk of auditory damage to cetaceans, and a low to moderate risk of seals being within the required range (63m assuming modified cylindrical spreading) of seismic operations[21]. Recent noise modelling undertaken for Appropriate Assessment of a 2D seismic survey in the Moray Firth indicated that there could be a potential zone of auditory impact up to 200m away (TTS in pinnipeds), but permanent effects would occur between 2 and 11m for bottlenose dolphin and pinnipeds respectively (Kongsberg 2010a). Thompson *et al.* (2013) reported a relative decrease in the density of harbour porpoises within 10km of a survey vessel in the Moray Firth during active survey, corresponding to received peak-to-peak SPLs at 5-10 km from source of 165-172 dB re 1 µPa, SELs for a single pulse of between 145-151 dB re 1 μPa^2 s^{-1}, and RMS levels of 148-155 dB re 1 µPa, and a relative increase in numbers at distances greater than 10km. Those individuals affected, or other individuals, returned to the survey area within a day. For the same survey, Pirotta *et al.* (2013) noted that there was not widespread displacement of harbour porpoise from the survey area, and 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. These changes may represent prey reactions to noise leading to reduced porpoise foraging, or a change in foraging effort if porpoises adjust time budgets or diving behaviour to avoid noise. The change in probability of occurrence of buzzes was characterised with reference to estimated received noise levels: 0.07-

[20] Note that this study had a limited dataset, and considered responses from a single harbour porpoise.
[21] Modified cylindrical spreading is usually considered to occur in water depths <1.5x range, i.e. spherical spreading (20logR) will occur to a range of 60m in a water depth of 40m.

0.31 for SEL that varied from 165 to 130 dB re 1 µPa^2 s. At distances of 0km and 40km, the probability of occurrence of buzzes increased from 0.15 to 0.35 respectively.

Table 4.2: Indicative spatial ranges of various injury and disturbance indicators for cetaceans and pinnipeds

	Cetaceans seismic	**Pinnipeds** seismic
Nominal vertical source level (dB p-p)	260	260
Horizontal array correction	-15	-15
Effective horizontal source level	245	245
Injury sound pressure level (multiple pulses; dB p-p)	230	218
Required propagation loss	15	27
Deep water (20logR) distance (m)	**5.6**	**22.4**
Shallow water (15logR) distance (m)	**10.0**	**63.1**
Behavioural response sound pressure level (single pulse; dB p-p)	224	212
Required propagation loss	21	33
Deep water (20logR) distance (m)	**11.2**	**44.7**
Shallow water (15logR) distance (m)	**25.1**	**158.5**
MTTS[22] (4kHz) response sound pressure level in porpoise (single pulse; dB p-p)	200	
Required propagation loss	45.3	
Deep water (20logR) distance (m)	**184**	
Shallow water (15logR) distance (km)	**1.05**	

Source: Southall et al. (2007), Lucke et al. (2009)

Many species of fish are highly sensitive to sound and vibration (review in MMS 2004). Exposure to high sound pressure levels has been shown to cause long-term (>2 months) damage to sensory cells in fish ears (Hastings *et al*. 1996, McCauley *et al*. 2003). Other reported effects include threshold shifts (hearing loss), stress responses and other behaviour alterations (review in Popper *et al*. 2003). A number of field studies have observed displacement of fish and reduced catch rates, suggested to be attributable to behavioural responses to seismic exploration (e.g. Skalski *et al*. 1992, Engås *et al*. 1996, Hassel *et al*. 2004, Slotte *et al*. 2004). 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

[22] Lucke *et al.* (2007) noted that the study harbour porpoise had an elevated hearing threshold compared to published audiograms which may have been due to auditory masking in the relatively noisy test environments or electrical "masking" in their equipment. They suggested therefore that the measured effects should be considered masked temporary threshold shifts (MTTS). MTTS is detected at higher exposure levels than TTS.

acute trauma. The physical vulnerability of seabirds to sound pressure is unknown, although McCauley (1994) inferred from vocalisation ranges that the threshold of perception for low frequency seismic in some species (e.g. penguins, considered as a possible proxy for auk species) would be high, hence only at short ranges would individuals be adversely affected. 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.

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 and behavioural criteria (e.g. Southall *et al.* 2007), and the outcome of studies on the effects of seismic activity on marine mammals (e.g. DECC 2011b, Kongsberg 2010a, Kongsberg 2010b, Thompson *et al.* 2013, 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 exploration 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 the acoustic effects and the relevant Natura 2000 sites are shown in Figures 5.5 (SPAs) and 5.6 (SACs).

4.5 Accidental spills

4.5.1 Historical spill frequency

An annual review of reported oil and chemical spills in the UKCS is made on behalf of the Maritime and Coastguard Agency (MCA) by the Advisory Committee on Protection of the Sea (e.g. Dixon 2013). This includes all spills reported by POLREP reports[23] by the MCA and PON1 reports to DECC – the latter are published monthly on the DECC website[24]. In 2012 a total of 246 releases were attributed to oil and gas installations operating in the open sea. The 2012 annual total was the lowest recorded since 2004 and 33 fewer than the mean annual total of 279 releases reported between 2000 and 2011. Analysis of oil types showed that 37% of reported releases were lubrication and hydraulic oils, followed by fuel oils at 24% and crude oils at 17%. The corresponding statistics from the 2011 survey were 32%, 33% and 23% respectively. The majority of spills were small, with some 94% of releases being less than 455 litres (100 gallons).

Well control incidents (i.e. "blowouts" involving uncontrolled flow of fluids from a wellbore or wellhead) have been too infrequent on the UKCS for a meaningful analysis of frequency based on UK data. A review of blowout frequencies cited in UKCS Environmental Statements as part of the OESEA2 gives occurrence values in the range 1/1,000-10,000 well-years. Analysis of the SINTEF Offshore Blowout Database which is based on blowout data from the US Gulf of Mexico, UKCS and Norwegian waters for period 1980 to 2005, provided blowout frequencies

[23] POLREP (pollution reports) relate to those issued in accordance with the Bonn Agreement, to alert Contracting Parties to relevant pollution events.
[24] https://www.gov.uk/oil-and-gas-environmental-data

(per drilled well) for exploration drilling of normal oil[25] ($2.5x10^{-4}$) and gas[26] wells ($3.6x10^{-4}$), as well as deep high pressure high temperature[27] oil ($1.5x10^{-3}$) and gas ($2.2x10^{-3}$) wells (OGP 2010). Accident statistics for offshore units on the UKCS estimated an annual average frequency of blowouts[28] for mobile drilling units of $6.6x10^{-3}$ per unit year for the period between 2000 and 2007 (based on analysis of a total of 455 unit years, Oil and Gas UK 2009).

4.5.2 Trajectory and fate of spilled oil

The main oil weathering processes following a surface oil spill are spreading, evaporation, dispersion, emulsification, dissolution, oxidation, sedimentation and biodegradation. The persistence of spilled crude oil depends on the characteristics of the oil, but typically is of the order of days to weeks. Diesel spills generally evaporate and disperse rapidly without the need for intervention. A major diesel spill of *ca.* 1,000 tonnes would disperse naturally in about 8 hours and travel some 24km in conditions of a constant unidirectional 30 knot wind.

To support environmental assessments of individual drilling or development projects, modelling is carried out for a major crude oil release, corresponding to a blowout (i.e. a worst case scenario based on expected well flow rates and nature of the crude oil, however unlikely that scenario might be), as well as the potential release of the drilling unit maximum hydrocarbon inventory. For gas installations modelling addresses a diesel spill. Comparatively small releases of certain types of oil, or small releases in sensitive areas, or small releases in certain circumstances, may have the potential to result in a significant environmental impact and may therefore require a substantial response (DECC OPEP guidance, 2012).

DECC OPEP guidance (2012) indicates that in addition to a series of minimum oil spill response requirements, installations operating in any Block wholly or partly within 25 miles (*ca*. 40km) of the coastline may have additional oil pollution incident response requirements dependent on the hydrocarbon inventory and oil pollution incident scenarios identified:

1. The presence near the facility at all times of a vessel:

    a. with the capability of spraying dispersant within 30 minutes of an oil pollution incident notification;

    b. Has a stock of dispersant sufficient to deal with an oil pollution incident of 25 tonnes, and if required, have the capability (equipment and capacity) of recovering any oil likely to be lost from the installation under a Tier 1 scenario;

2. In the event of a Tier 2 incident, Tier 2 resources must be available on scene within half the time taken for the oil to reach shore in 30 knot wind conditions;

3. Details of resources to deal with a Tier 3 incident (i.e. an oil pollution incident that cannot be controlled by Tier 1 or 2 resources), including sources transport and delivery system;

[25] A well where the formation has an estimated gas/oil ratio less than 1,000.
[26] A well where the formation has an estimated gas/oil ratio exceeding 1,000.
[27] A well with an expected shut-in pressure equal to or above 690 bar (10,000psi) and/or bottom hole temperatures equal to or above 150°C.
[28] An uncontrolled flow of gas, oil or other fluids from the reservoir, i.e. loss of 1.barrier (i.e. hydrostatic head) or leak and loss of 2. barrier, i.e. BOP/DHSV.

4. A Shoreline Protection Strategy Plan.

4.5.3 Potential ecological effects

The most vulnerable components of the ecosystem to oil spills in offshore and coastal environments are seabirds and marine mammals due to their close association with the sea surface.

Of the species commonly present offshore in UK offshore waters, gannet, skuas and auk species may be considered to be most vulnerable to oil pollution due to a combination of heavy reliance on the marine environment, low breeding output with a long period of immaturity before breeding, and the regional presence of a large percentage of the biogeographic population. Vulnerability is seasonal, with a general trend of high vulnerability in coastal areas adjacent to colonies during the breeding season. In winter, vulnerability in inshore waters can also be very high in some areas.

Oil spill risks to marine mammals have been reviewed by successive SEAs[29] for previous licensing Rounds and their supporting technical reports (e.g. Hammond *et al*. 2004, Hammond *et al*. 2008). Generally, marine mammals are considered to be less vulnerable than seabirds to fouling by oil, but they are at risk from hydrocarbons and other chemicals that may evaporate from the surface of an oil slick at sea within the first few days, and any accidental ingestion or breathing of oily fumes could cause physiological stress (Law *et al.* 2011). Symptoms from acute exposure to volatile hydrocarbons include irritation to the eyes and lungs, lethargy, poor coordination, difficulty with breathing and mortality (Hammond *et al*. 2002).

Grey and harbour seals come ashore regularly throughout the year between foraging trips and additionally spend significantly more time ashore during the moulting period (February-April in grey seals and August-September in harbour seals) and particularly the pupping season (October-December in grey seals and June-July in harbour seals). Animals most at risk from oil coming ashore on seal haulout sites and breeding colonies are neonatal pups, which rely on their prenatal fur and metabolic activity to achieve thermal balance during their first few weeks of life, and are therefore more susceptible than adults to external oil contamination.

Benthic habitats and species may be sensitive to deposition of oil associated with sedimentation, or following chemical dispersion. The proportion of a surface spill that is deposited to the seabed might be expected to increase as a result of high turbulence and suspended solids concentrations in the water column, both associated with storm conditions in shallow water.

With respect to **oil spills**, any Block should be screened in that is within 40km of the coast or a Natura 2000 site with qualifying primary and non-primary features vulnerable to spills. This also reflects the 25 mile distance used by DECC OPEP guidance (2012) to define Blocks with additional oil pollution incident response requirements.

Blocks screened in on the basis of spill effects and the relevant Natura 2000 sites are included in Figures 5.1 (SPAs) and 5.2 (SACs).

[29] See: Offshore Energy Strategic Environmental Assessment (SEA): An overview of the SEA process.

4.6 Consideration of mobile species

This screening assessment considers the potential for mobile species (primarily seabirds and marine mammals) to interact with potential exploration/appraisal activities in 28th Round Blocks outside of Natura 2000 sites.

4.6.1 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). 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 4.3 provides indicative mean foraging ranges for a range of seabird species and these represent typical or likely distances travelled by different species from a breeding colony to a foraging area. However, caution is required when using limited foraging range data, for example the use of a single breeding season or location, to provide ‘‘representative’’ foraging range information (Thaxter *et al*. 2012). The mean foraging range value has been used because significant effects on the qualifying features at a population level are only possible within the foraging range where most birds are present.

Given that all 28th Round Blocks within 40km of the coast have already been screened in through application of the oil spill criteria, Table 4.3 highlights those species with a mean foraging range greater than 40km – gannet, fulmar and lesser black-backed gull (guillemot is also included given a mean foraging range of close to 40km and the extent of variation). These are species for which there is in theory potential for interaction with activities in 28th Round Blocks that have not already been screened in.

Table 4.3: Indicative breeding season mean foraging ranges

Species	Mean* (km)	Confidence level**
Common eider	2.4	Poor
Red-throated diver	4.5	Low
Fulmar	47.5 ± 1	Moderate
Manx shearwater	2.3 ± 0.8	Moderate
Gannet	92.5 ± 59.9	Highest
Cormorant	5.2 ± 1.5	Moderate
Shag	5.9 ± 4.7	Moderate
Arctic skua	6.4 ± 5.9	Uncertain
Black-headed gull	11.4 ± 6.7	Uncertain
Common gull	25	Poor
Mediterranean gull	11.5	Uncertain
Herring gull	10.5	Moderate
Lesser black-backed gull	71.9 ± 10.2	Moderate
Kittiwake	24.8 ± 12.1	Highest
Sandwich tern	11.5 ± 4.7	Moderate
Roseate tern	12.2 ± 12.1	Low
Common tern	4.5 ± 3.2	Moderate
Arctic tern	7.1 ± 2.2	Moderate
Little tern	2.1	Low

Species	Mean* (km)	Confidence level**
Guillemot	37.8 ± 32.3	Highest
Razorbill	23.7 ± 7.5	Moderate
Puffin	4	Low

*Note: *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. **Arbitrary confidence levels were assigned to the representative foraging ranges.*
Source: Thaxter et al. (2012)

With respect to the area outside of 40km from the coast, the distribution of all four species varies throughout the year but in general they are widely distributed at low densities with areas of moderate or higher density (e.g. the shelf edge for gannet and lesser black-backed gulls, the Dogger Bank for guillemots Stone *et al*. 1995). Some high density areas are also likely to be transitory, associated with short-lived natural feeding aggregations or attraction to fishing vessels. A DECC-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 distributions 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. With respect to guillemots, offshore areas such as the central northern North Sea were less important during the breeding season, but were more important at other times of year such as July and over winter (Stone *et al*. 1995).

Given the relatively small seabed footprint associated with rig placement/installation and drilling discharges coupled with the relatively low densities of seabirds beyond 40km of the coast, the potential disturbance and drilling effects associated with the drilling of an exploration well within a Block applied for is considered unlikely to significantly affect the distribution and extent of foraging habitats which support the species. None of the four species 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 potential exploration activities in relevant Blocks. The likely low density of gannets and guillemots in offshore areas outside of 40km from the coast and limited exposure time during foraging dives indicates that significant acoustic disturbance associated with seismic survey is also unlikely. Therefore, no additional Blocks outside of 40km were screened in with respect to foraging seabirds. SNCB advice on a draft of this screening report was to consider Blocks within Quadrants 154 and 164 in relation to foraging gannets from the St Kilda SPA and other adjacent colonies. Based on the important bird areas identified by Kober *et al*. (2012) and reflected in dSPA proposals (see Figures 3.1 and 5.8) and the location of Blocks applied for, the above consideration is considered equally applicable and that significant effects on site features are not likely.

Important areas of seabird activity outside designated sites have been identified around the UK coast as part of an ongoing process to identify possible marine SPAs for seabirds (Kober *et al*. 2010, 2012). Important areas were identified through application of the UK SPA selection guidelines to the European Seabirds at Sea data (1980-2006). This research has been used by SNH to inform proposals for inshore sites (within 12 nautical miles) and by JNCC for offshore sites (from 12 to 200 nautical miles), and a number of draft SPAs have been identified for consideration (see Figure 5.7, SNH & JNCC 2014).

For the purposes of the screening assessment, Blocks within 40km of the coast or a dSPA have been screened in through application of the oil spill criteria.

4.6.2 Marine mammals

Grey seal telemetry data from 1991-2011 and harbour seal telemetry data from 1991-2012 have been combined with count data from 1988-2012 to produce UK-wide maps by species of estimated density (Jones *et al*. 2013). Figures 5.8 and 5.9 show the UK wide density of grey and harbour seals respectively in relation to the 28th Round blocks applied for. 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*. 2013). Blocks within 40km of the coast have already been screened in through application of the oil spill criteria (Section 4.5), and therefore Blocks within proximity to haulouts and core foraging areas are already screened in for further assessment.

Of those Blocks beyond 40km from the coast, all fall within areas of estimated low to moderate seal use. Of those Blocks which are located partly or wholly within areas of moderate use but which are also not already screened in for further assessment under other criteria (e.g. physical disturbance, Section 4.3), only Block 48/1b could be considered for further assessment on the basis of estimated seal usage. However, this Block is largely adjacent to rather than within a small area of moderate usage. Whilst there is the possibility that seals may be present in Blocks for which activities are proposed, their presence is likely to be transient and in low numbers relative to the wider population and management unit (IAMMWG 2013) for the relevant species, and any activities are not likely to generate significant effects for sites related to the species features (e.g. in terms of habitat structure and function and species population and distribution). SNCB advice on a draft of this screening report was to consider Blocks within Quadrant 166 in relation to grey seals from the North Rona SAC foraging and transiting. Based on the estimated total density of grey seals shown in Figure 5.8 and the location of Blocks applied for in relation to the management units proposed for both UK seal species (IAMMWG 2013), significant effects on site features are not considered likely. Where relevant, more detailed information from seal tracking studies (e.g. those described by Russell & McConnell 2014), will inform the AA process.

Analyses of photo-identification data and some genetic studies have shown that within European waters there are coastal/inshore groups of bottlenose dolphins that are mobile and range over large areas but still show strong site fidelity along defined stretches of coast (see ICES 2013 and references therein, 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 have proposed a series of bottlenose dolphin management units for UK waters (Figure 5.10); similar but not identical management units have been proposed for the UK by IAMMWG (2013). These offer a mechanism to take account of the likely range of bottlenose dolphin movements from relevant SACs (identified on Figure 5.10), and therefore be an additional relevant screening criterion. However, this would not result in any additional Blocks being screened in to those already selected through the application of those methods outlined in Sections 4.3-4.5.

The harbour porpoise is common and widespread around the UK (Reid *et al*. 2003). Since the 1990s it appears to have become much less common around the Northern Isles, while increasing in numbers in the English Channel and southern North Sea (Hammond *et al*. 2013). For reasons not yet fully understood, individuals of the North and Celtic Seas population appear to concentrate in some areas close to the coast between June and September with a portion of the population remaining in those regions year-round. These coastal areas are often where there is a high degree of water mixing, sometimes associated with strong tidal streams and high biological productivity. There may also be offshore areas supporting similar concentrations. The Skerries and Causeway SCI in Northern Ireland is the only site currently designated for

harbour porpoise (as a qualifying non-primary feature), although efforts are underway to identify if there are suitable sites in UK waters for SAC designation. The management units established for harbour porpoise are large, with just 3 covering all UK waters (ICES 2013, IAMMWG 2103); consequently population scale effects from Block specific exploration activities are considered unlikely.

4.7 Cumulative and in-combination effects

This screening assessment includes the potential for cumulative and in-combination effects leading to likely significant effects on European sites resulting from the interaction of exploration/appraisal activities in 28th Round Blocks with activities resulting from other marine plans, programmes and activities. The uncertainty over the scale and timing of activities which could follow licensing of 28th Round Blocks and the activities resulting from other plans and programmes is recognised. Using the GIS, the 28th 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
- Carbon Capture and Storage Agreement for Leases
- Existing oil and gas infrastructure
- Marine renewable energy developments and zones
- Aggregate extraction areas
- Navigation density

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

5 Screening

5.1 Screening of potential effects of 28th Round Block activities

The screening of the various sources of impact from exploration and appraisal activities which could follow licensing of the 28th Round Blocks (as described in Section 4) were applied to the relevant European sites as well as mobile species when not within site boundaries using a GIS. 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 – 5.6 illustrate these initial screening results as paired maps showing the Blocks (with Blocks screened in distinguished) in relation to relevant SPAs and SACs respectively. Figures 5.7 – 5.10 illustrate the screening consideration for mobile species. The Blocks screened in at this stage are listed on Table 5.1.

Table 5.1: List of Blocks initially screened in

9/28b	35/27	43/1	49/9d	107/11	204/25c
12/21d	37/26	43/2	49/13	107/16	204/30b
12/26c	37/27	43/6	49/28e	110/12b	205/9
12/30	38/13	43/19b	103/2	110/13c	205/10
13/16b	38/14	43/20c	103/3	110/13e	205/13
13/17	38/15	43/23	106/14	110/14b	205/19b
13/21c	38/18	44/17e	106/15	110/15b	205/26d
15/24a	38/19	44/18c	106/19	110/17	206/5
15/25d	38/20	44/27	106/20	110/18b	206/16b
18/1	39/11	47/9d	106/22	165/5	206/17
18/2	39/16	47/14e	106/23	166/1	206/21
18/4	41/1	48/3	106/24	166/2	207/1b
18/5	41/2	48/8b	106/26	166/7	
18/9	42/10b	48/16	106/27	175/29	
19/15	42/11	49/3	106/28	175/30	
35/26	42/28c	49/4d	106/29	176/26	

5.2 Screening for potential cumulative and in-combination effects

The Blocks identified (see Table 5.1) for further assessment were considered further in terms of the potential for likely significant effects to arise from cumulative and in-combination effects between activities in 28th Round Blocks and other marine activities.

Figures 5.11 and 5.12 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 28th Round Blocks (with those screened in identified). Since oil and gas licence Blocks typically do not overlap each other, coupled with the existing controls on exploration and appraisal operations, significant cumulative and in-combination effects on European sites can be discounted. 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 remote from any European sites and cumulative and in-combination effects are not likely.

Figures 5.13 and 5.14 illustrate existing oil and gas infrastructure, relevant European sites and the 28th Round Blocks. Based on the lack of spatial overlap, documented scale of effects from production operations together with existing controls on exploration and appraisal operations, significant cumulative and in-combination effects on European sites would not occur because of the application of existing controls and mandatory assessments.

Figures 5.15 and 5.16 show marine renewable energy development and development zones, relevant European sites and the 28th Round Blocks. A number of Blocks overlap with renewable energy developments, with a number also coinciding with European sites (specifically Blocks 110/17 and 110/18b overlap with the Liverpool Bay/Bae Lerpwl SPA, and Blocks 37/27, 38/18, 38/19, 38/20, 43/2 overlap with the Dogger Bank SCI. In all cases these Blocks have been screened in to the second stage of HRA when the potential for significant cumulative and in combination effects on European sites would be assessed.

Marine aggregate extraction areas, relevant European sites and the 28th Round Blocks are shown in Figures 5.17 and 5.18. A number of Blocks overlap licensed aggregate extraction areas or those which are presently under consideration as option or application areas, with a number also coinciding with European sites (specifically Block 110/18b overlaps with the Liverpool Bay/Bae Lerpwl SPA and Block 49/13 lies within the North Norfolk Sandbanks and Saturn Reef SCI). In all cases these Blocks have been screened in to the second stage of HRA when the potential for significant cumulative and in-combination effects on European sites would be assessed.

Figures 5.19 and 5.20 illustrate the spatial relationship between the density of navigation use of UK waters, relevant European sites and the 28th Round Blocks. The 28th Round Blocks coincident with areas of elevated navigation density in or in proximity to European sites (where potential significant cumulative and in-combination effects could occur) have been screened in to the second stage of HRA where this consideration will be made.

Figure 5.1: Blocks screened in, showing SPAs

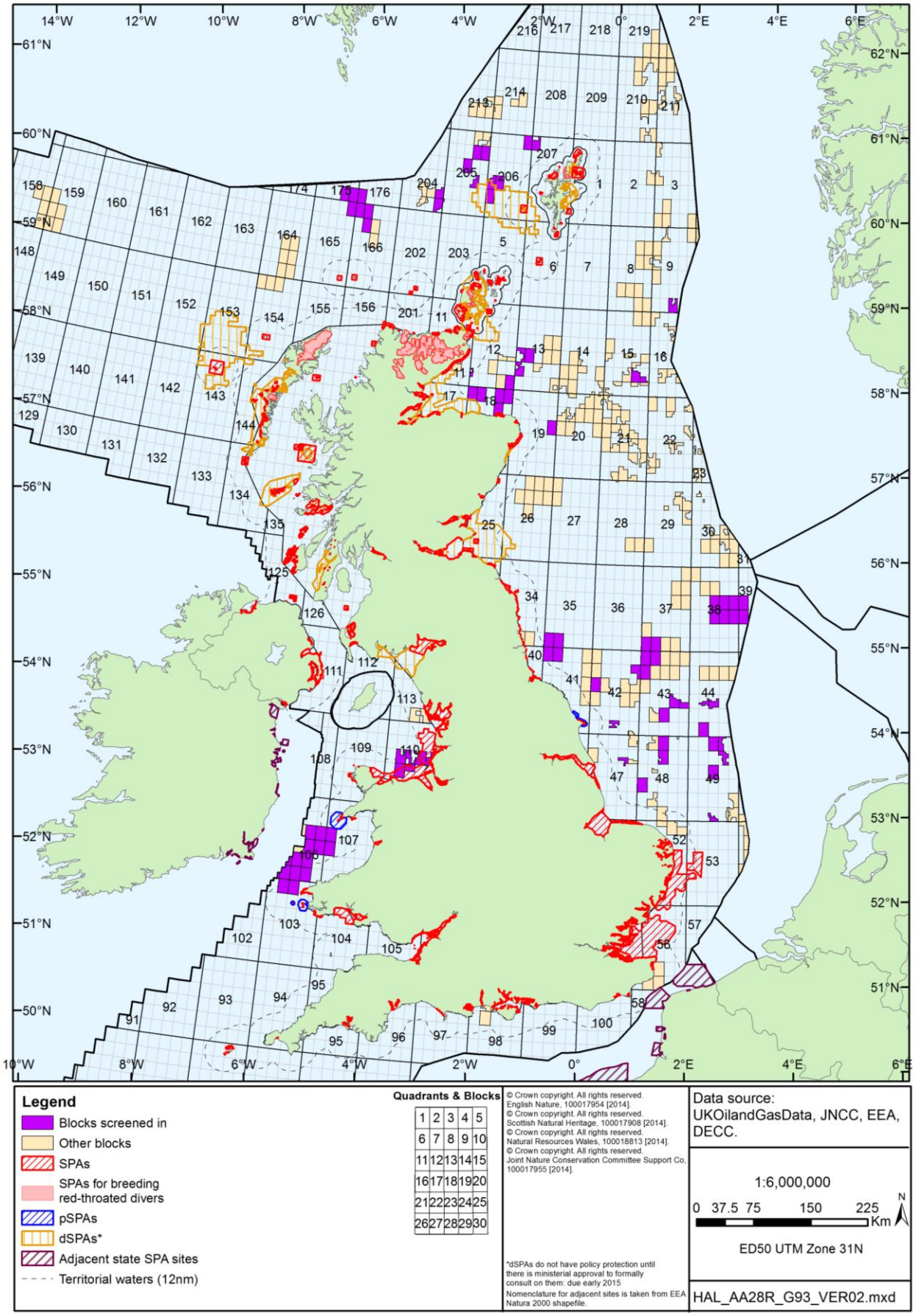


Figure 5.2: Blocks screened in, showing SACs

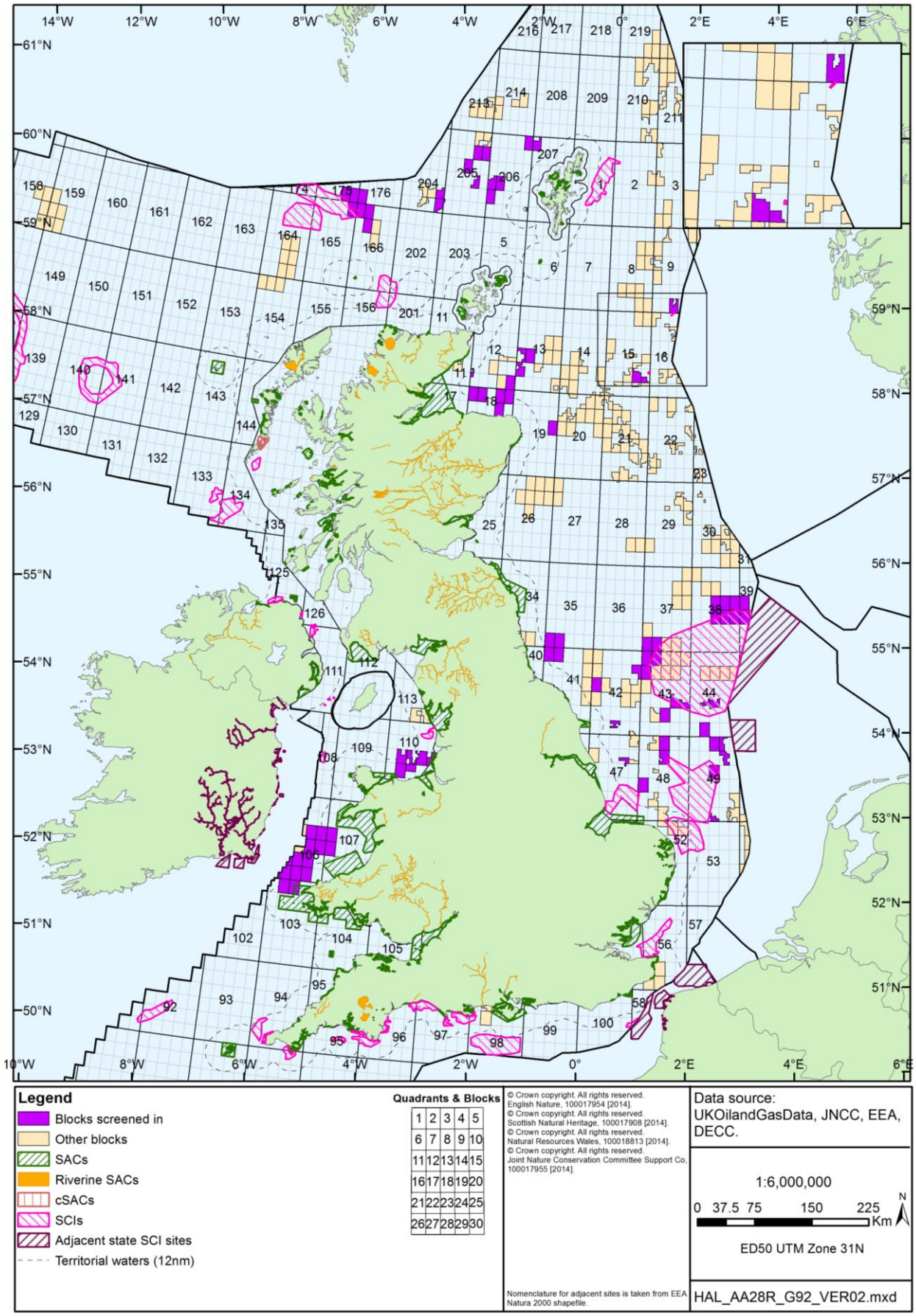


Figure 5.3: Disturbance and drilling - Blocks screened in, showing SPAs

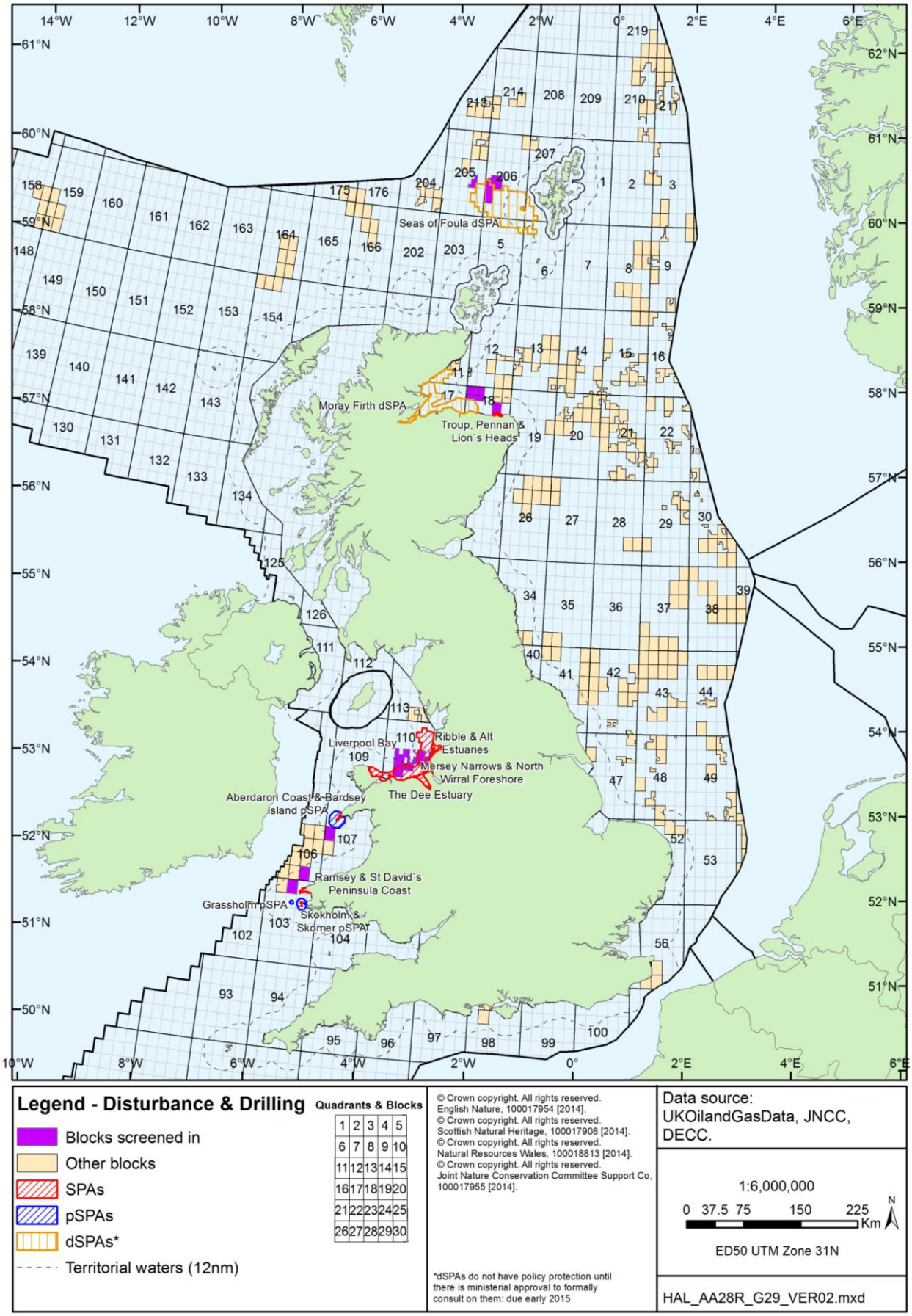


Figure 5.4: Disturbance and drilling - Blocks screened in, showing SACs

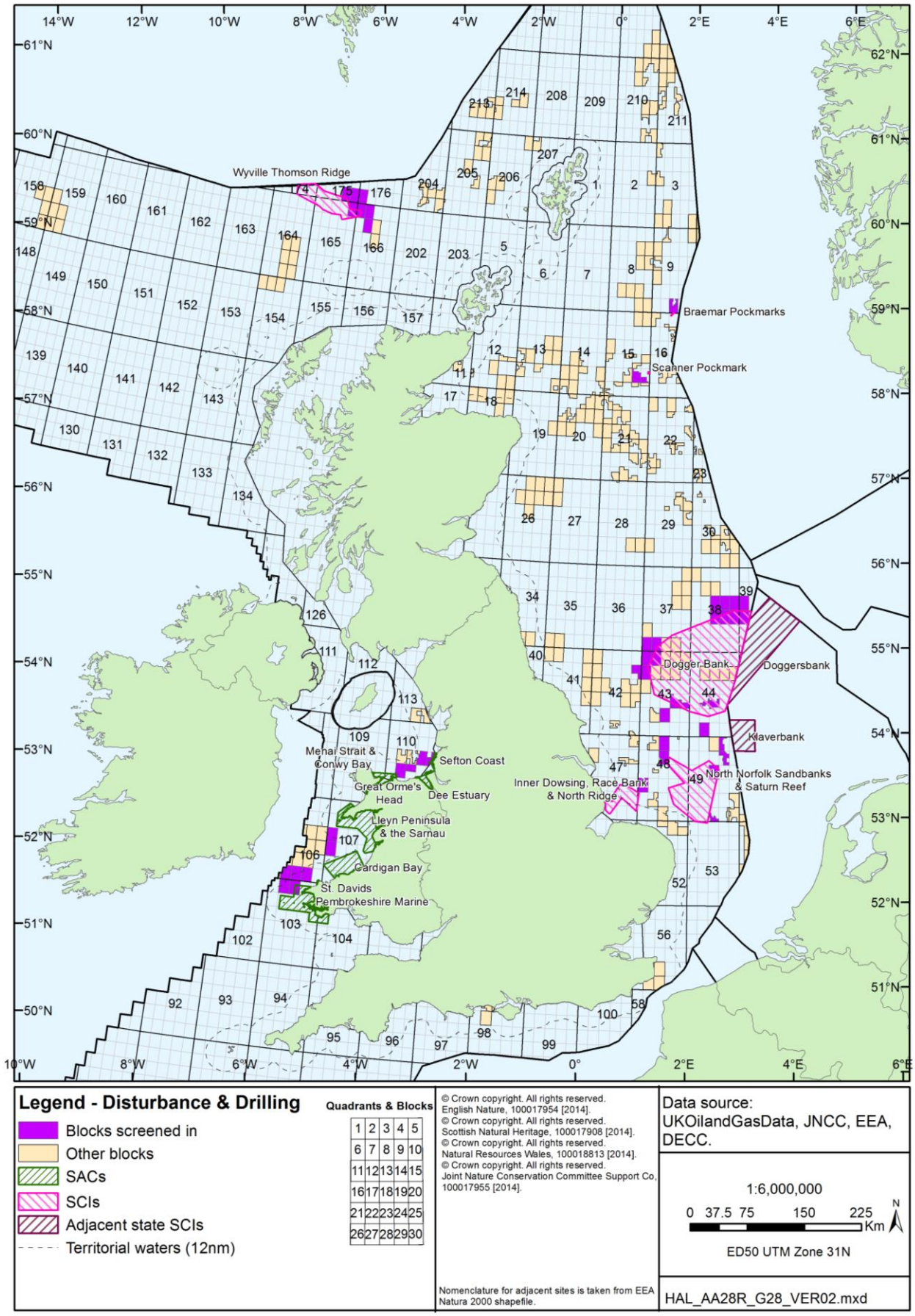


Figure 5.5: Acoustic effects - Blocks screened in, showing SPAs

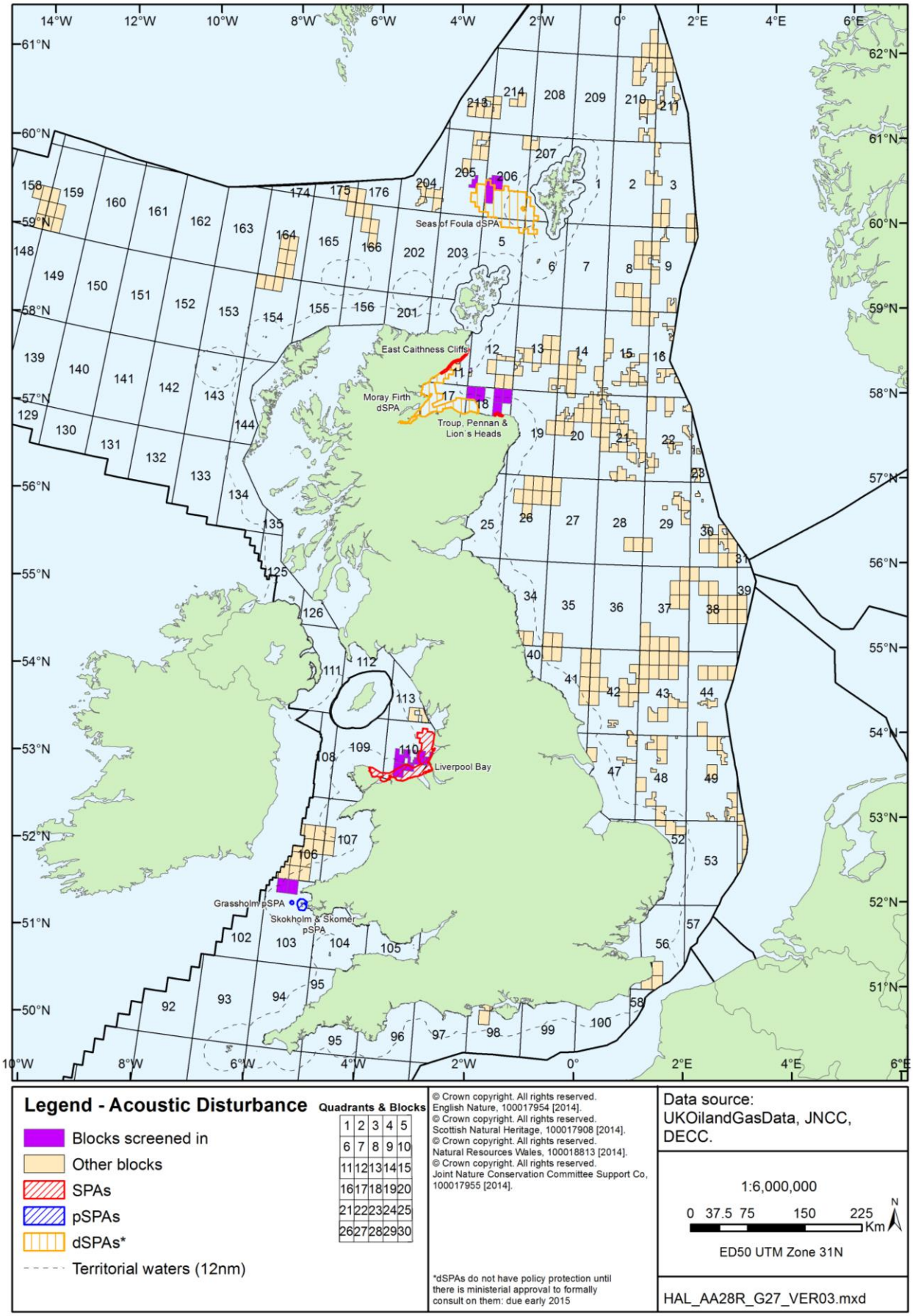


Figure 5.6: Acoustic effects - Blocks screened in, showing SACs

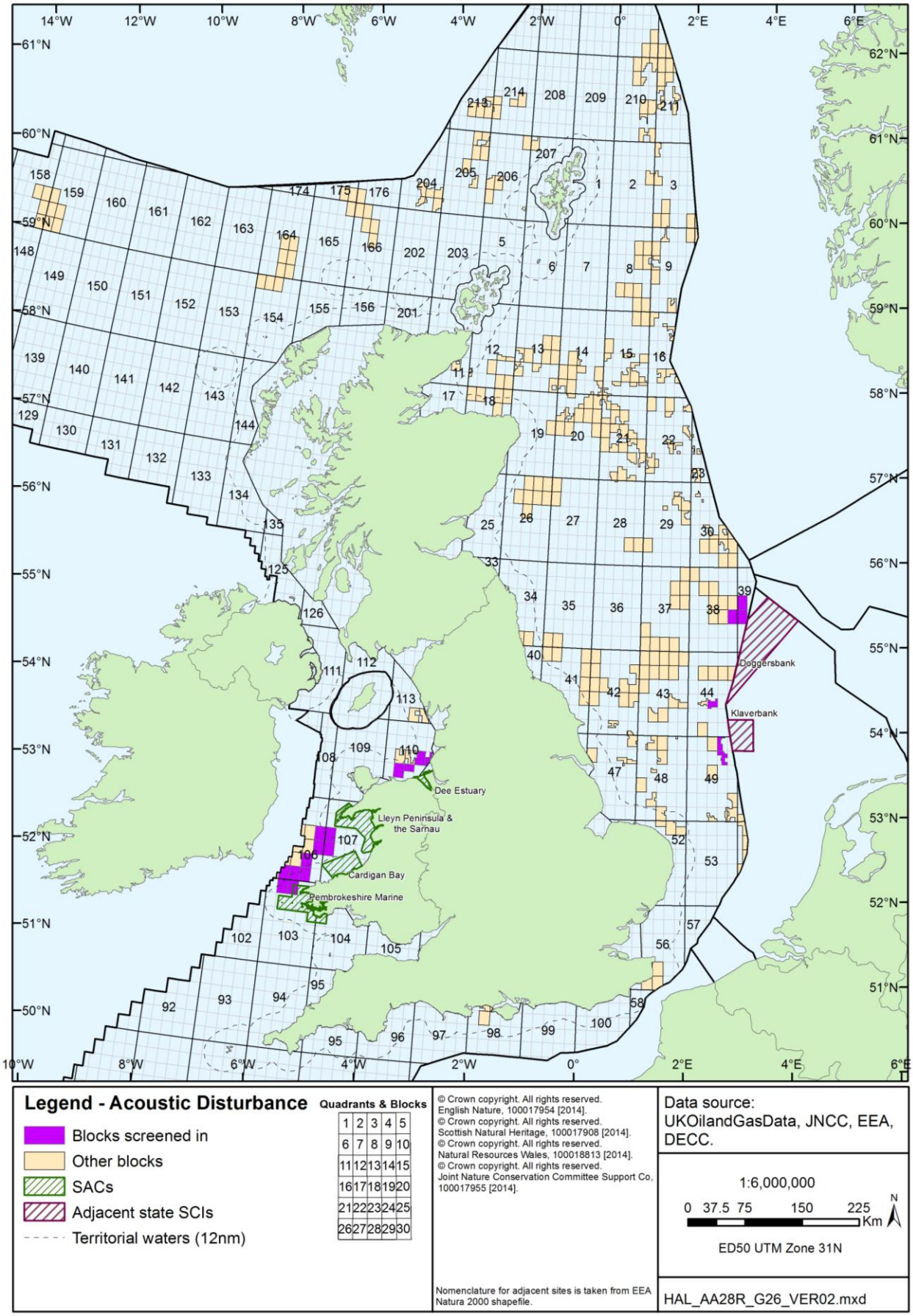


Figure 5.7: Important seabird areas

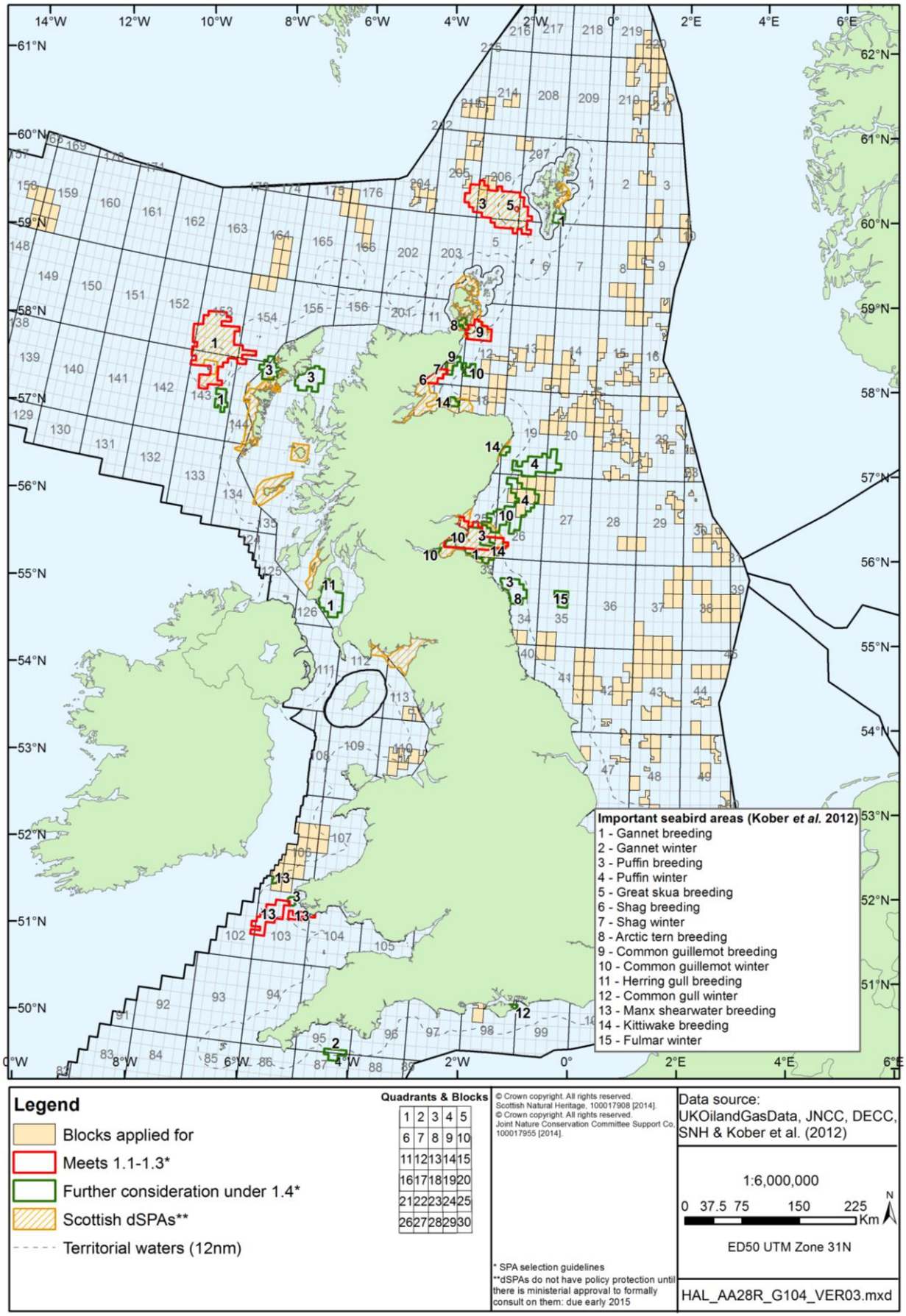


Figure 5.8: Estimated total density of grey seals in UK waters

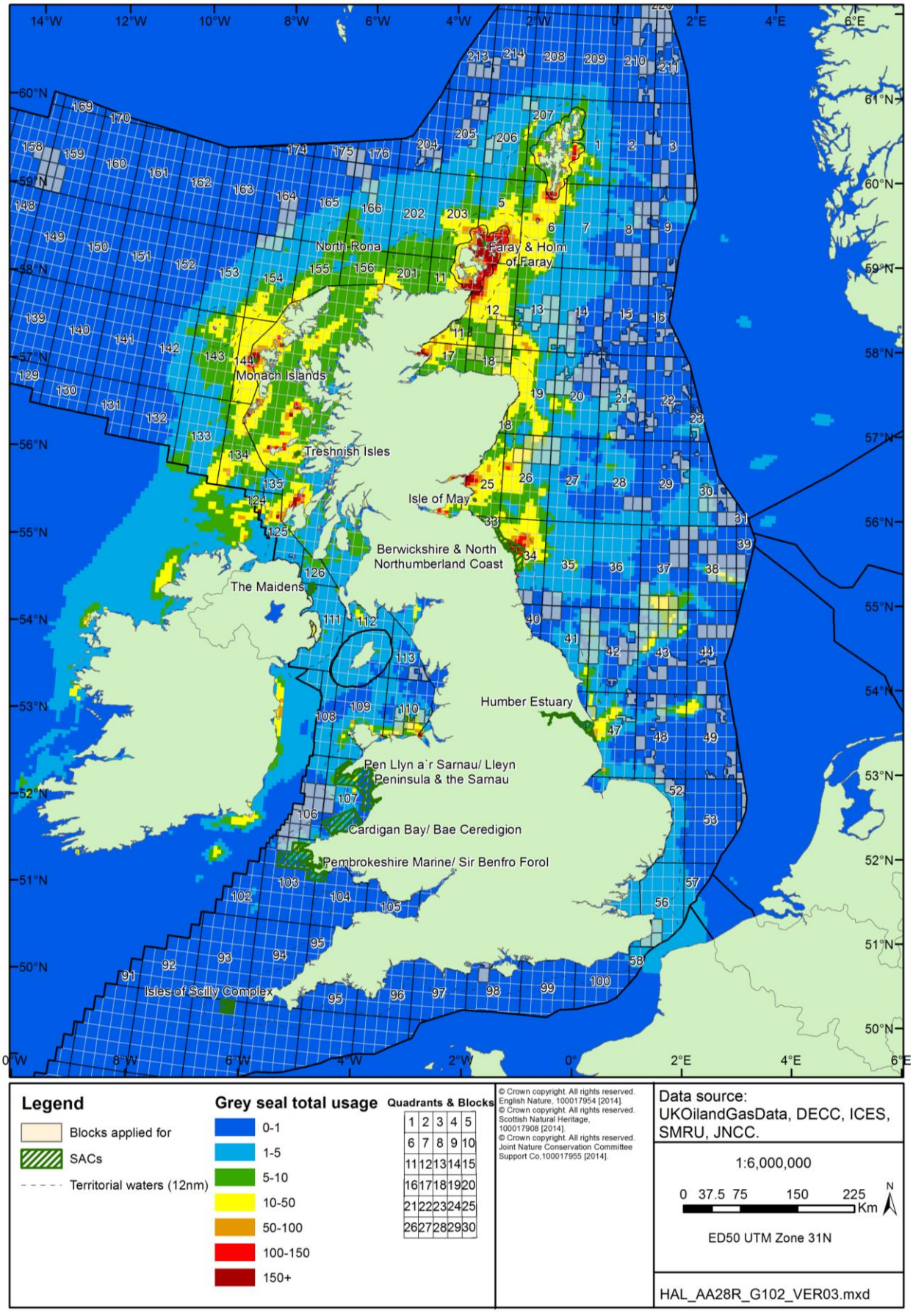


Figure 5.9: Estimated total density of harbour seals in UK waters

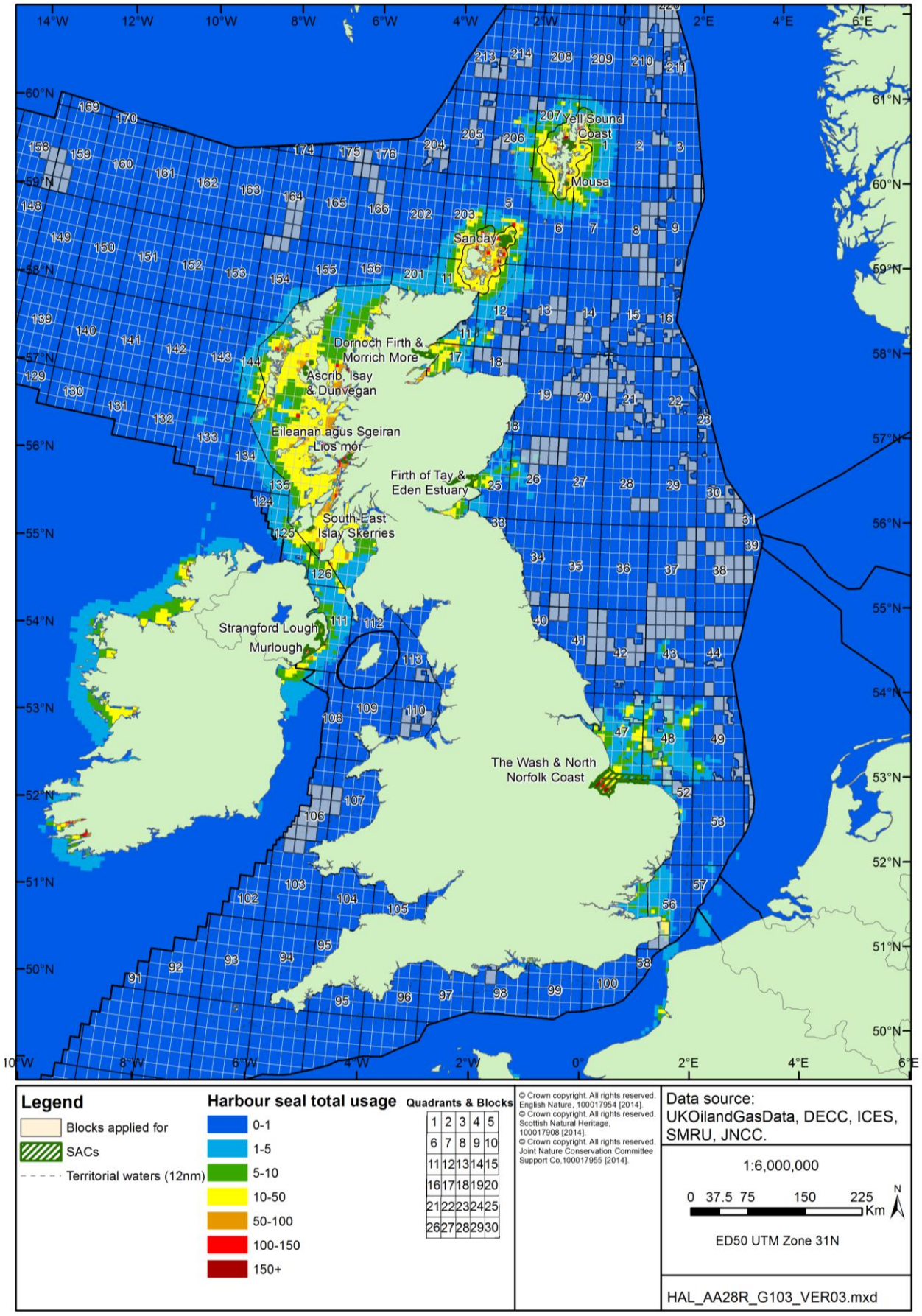


Figure 5.10: Proposed bottlenose dolphin management units in the UK

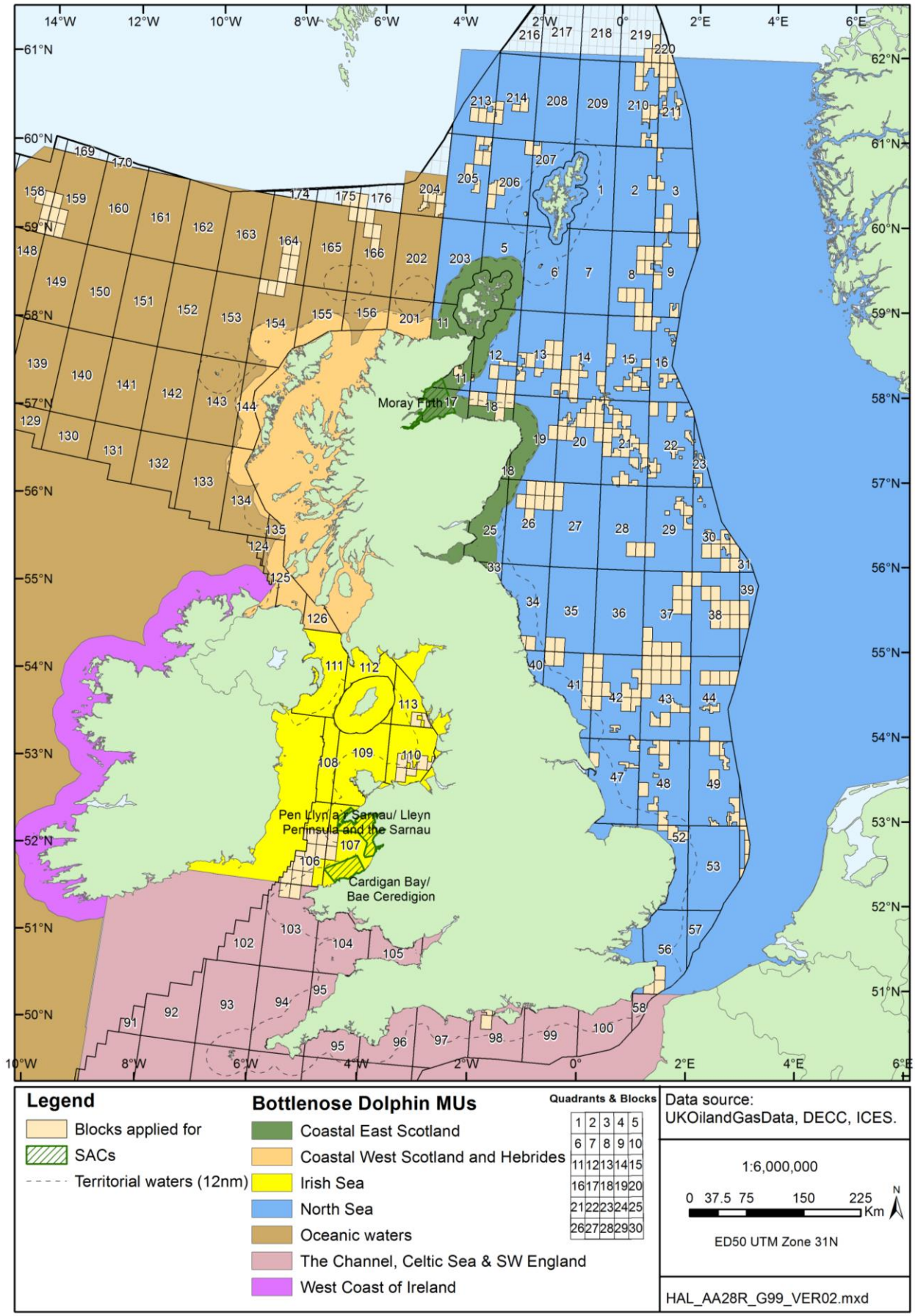
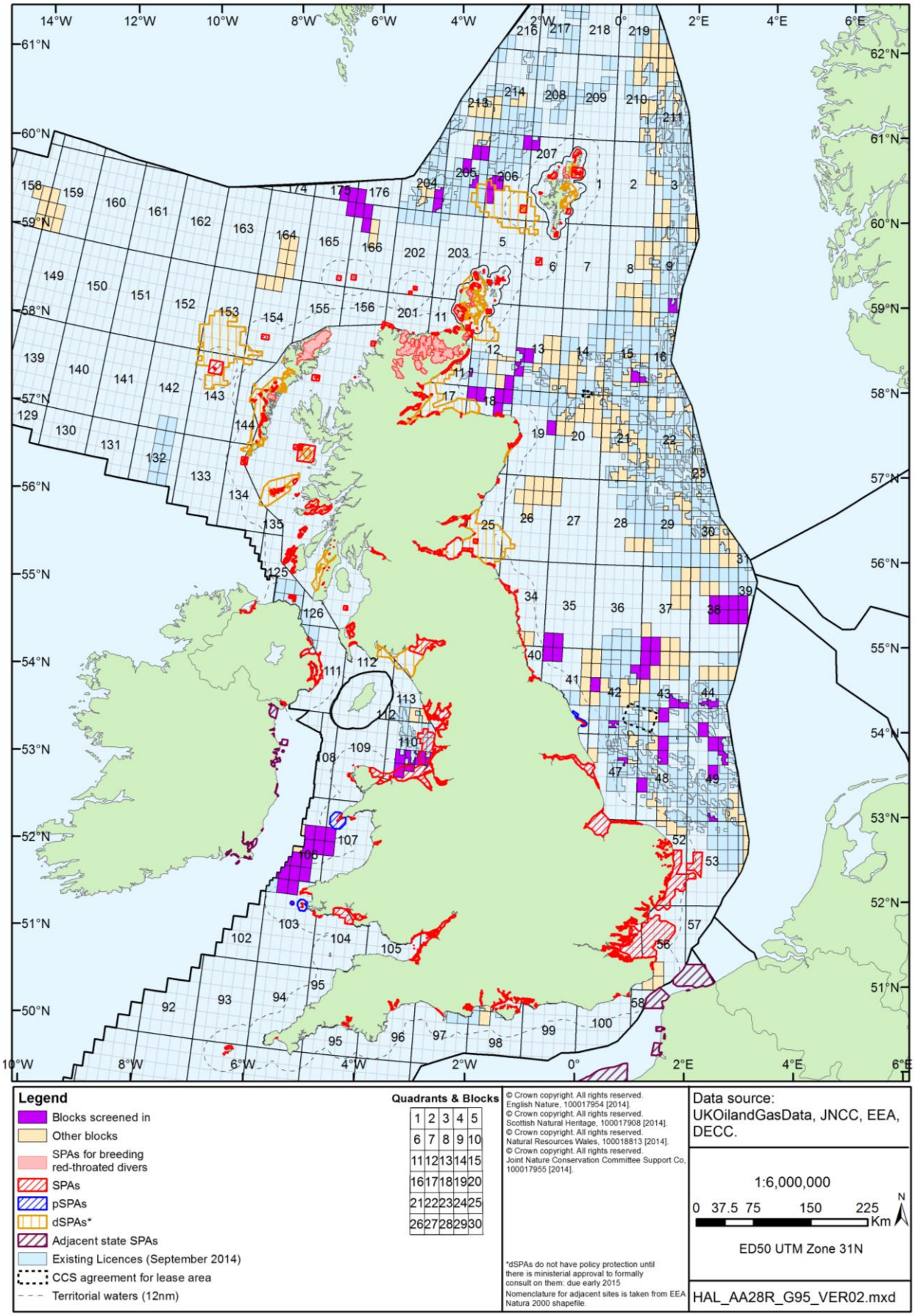
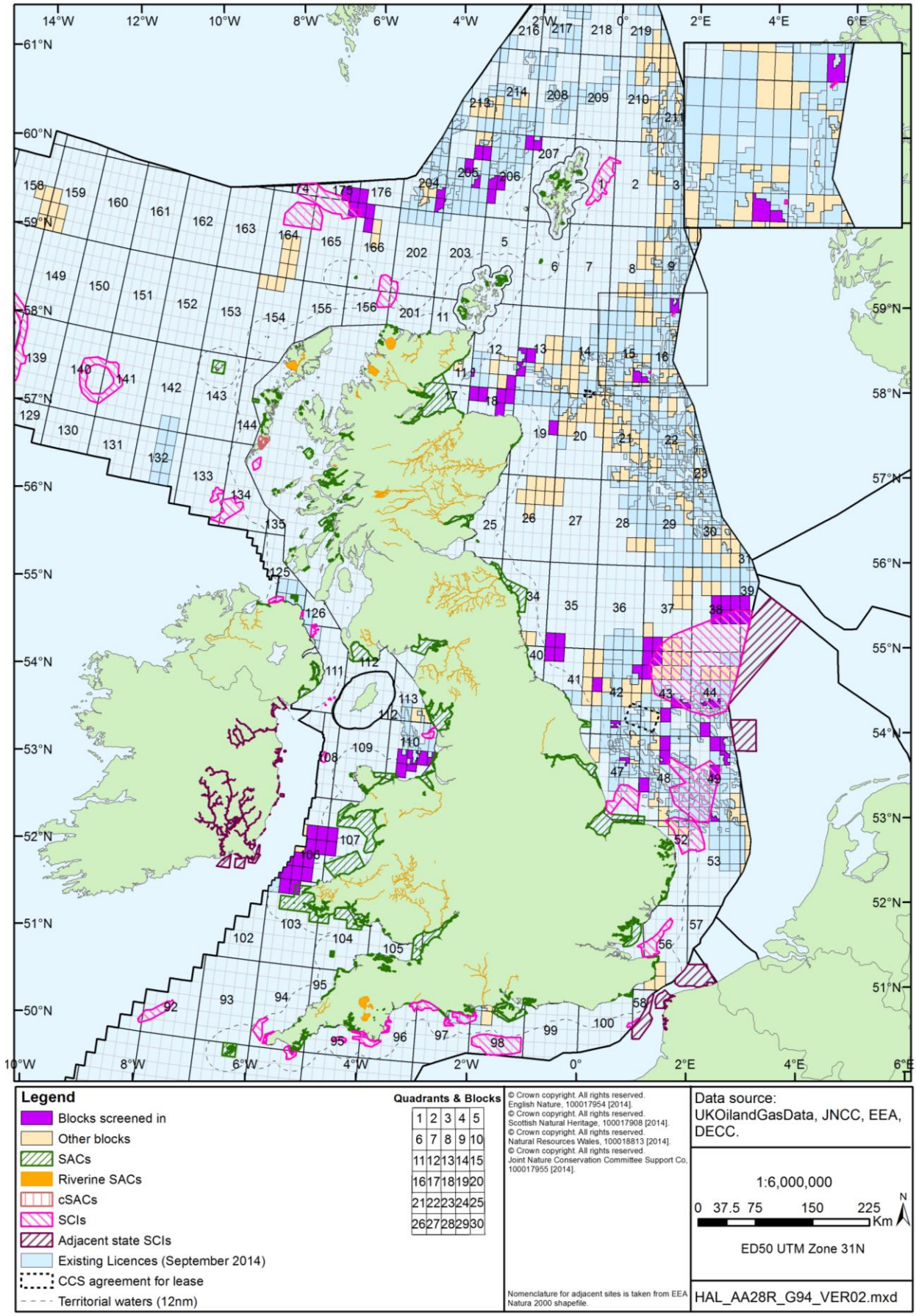


Figure 5.11: Existing Oil and Gas licences, CCS AFL*s, SPAs and 28th Round Blocks



**CCS AFLs= Carbon Capture and Storage Agreement for Leases*

Figure 5.12: Existing Oil and Gas licences, CCS AFL*s, SACs and 28th Round Blocks



**CCS AFLs= Carbon Capture and Storage Agreement for Leases*

Figure 5.13: Oil and Gas infrastructure, SPAs and 28th Round Blocks

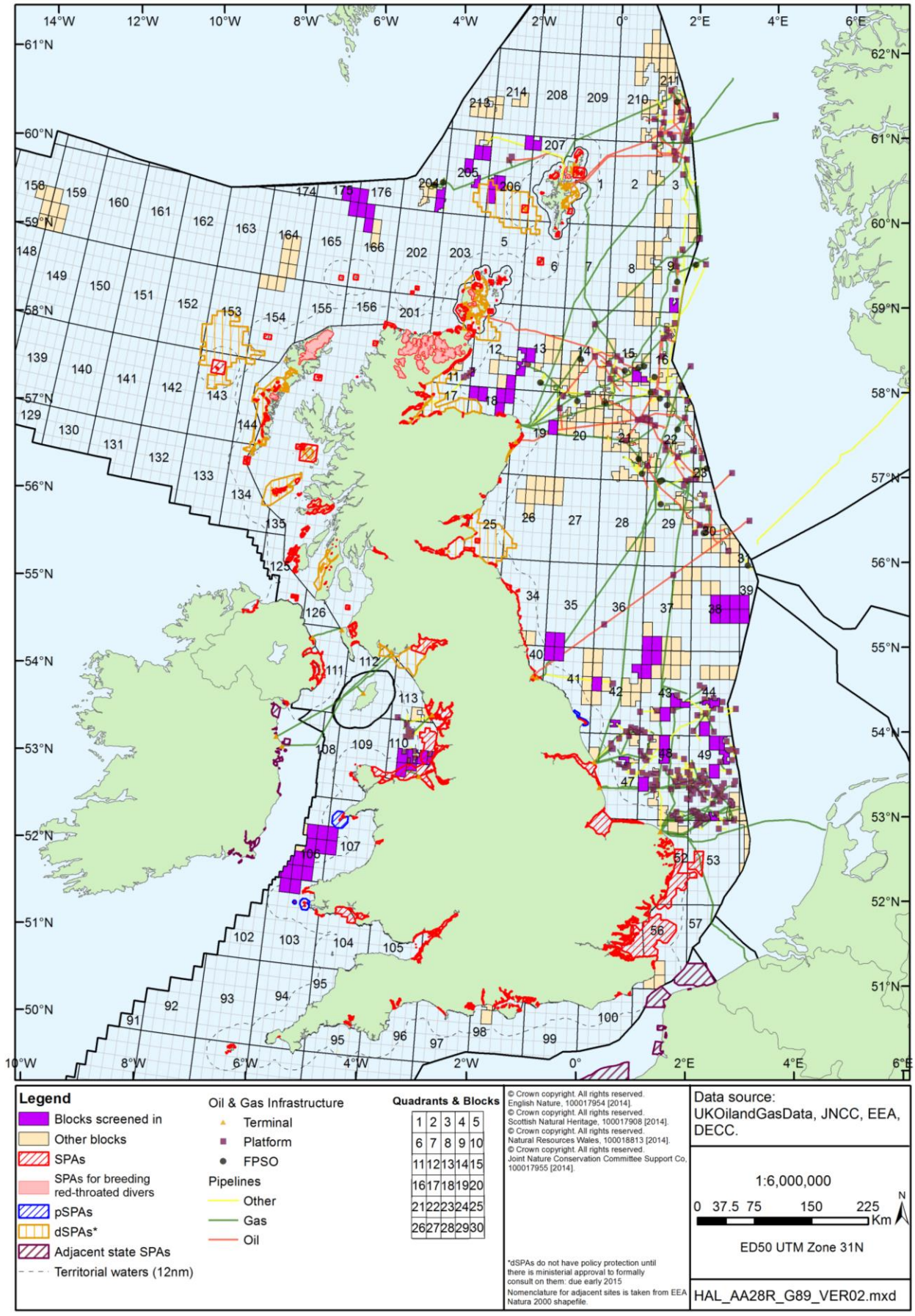


Figure 5.14: Oil and Gas infrastructure, SACs and 28th Round Blocks

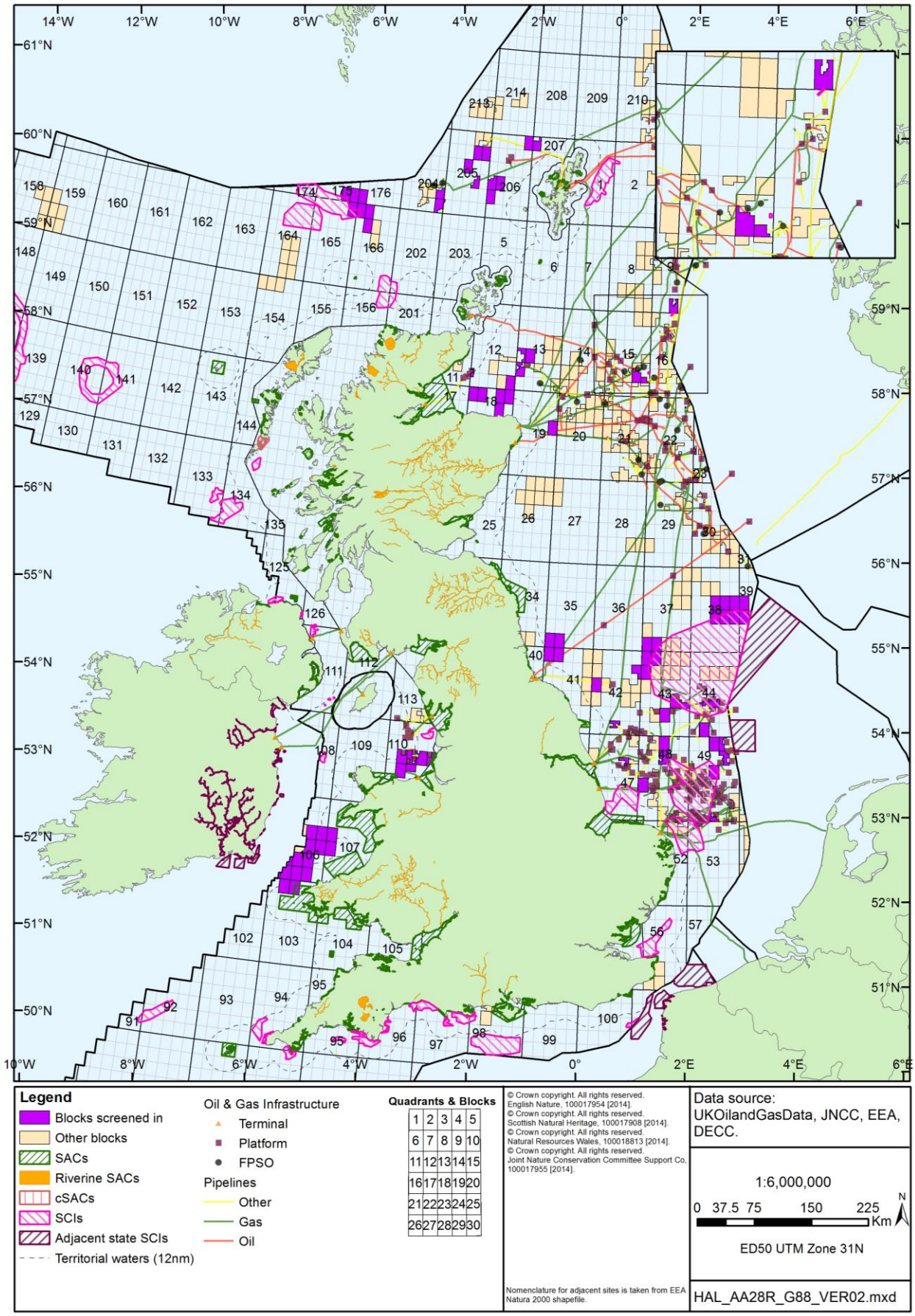


Figure 5.15: Marine renewable energy, SPAs and 28th Round Blocks

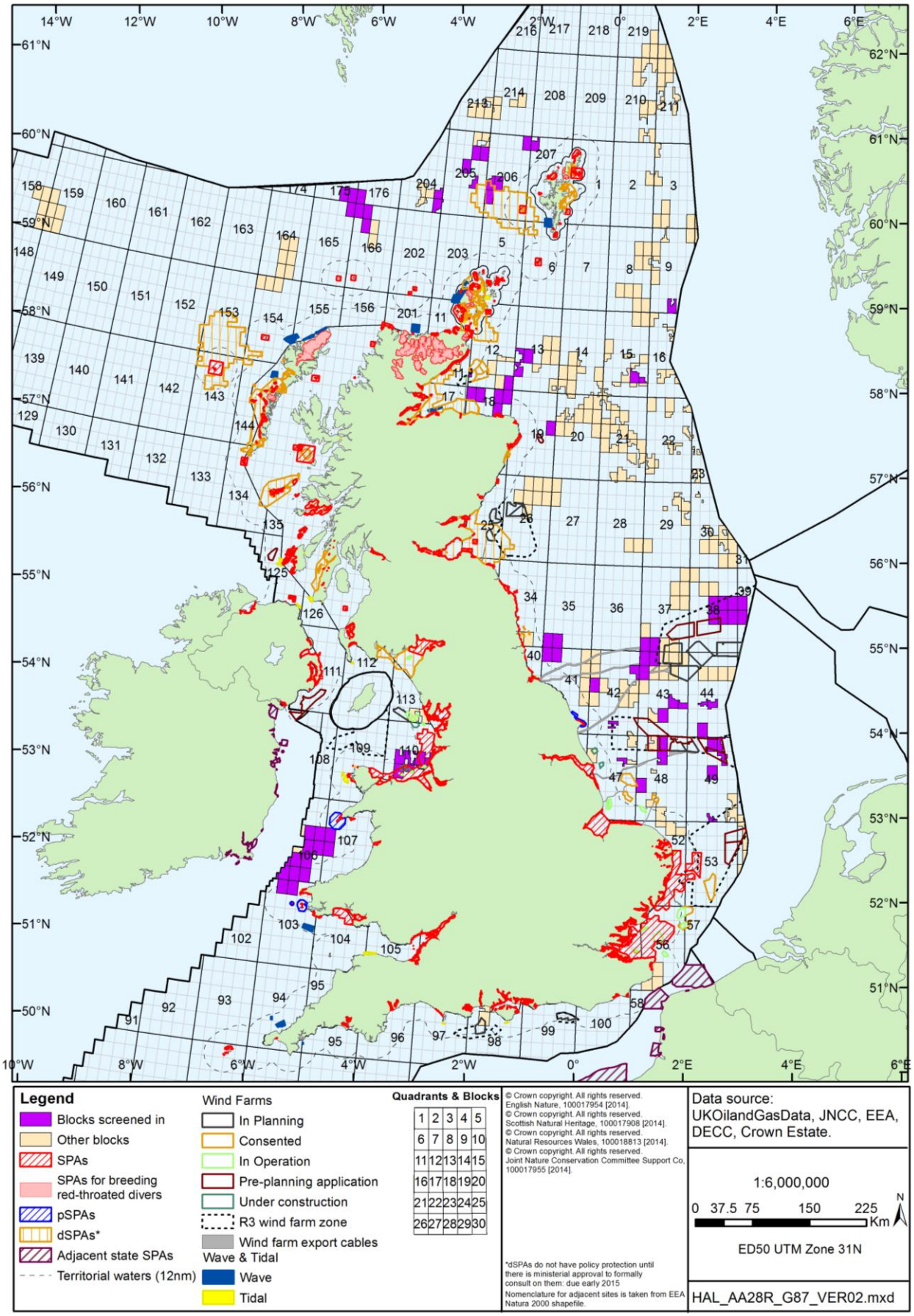


Figure 5.16: Marine renewable energy, SACs and 28th Round Blocks

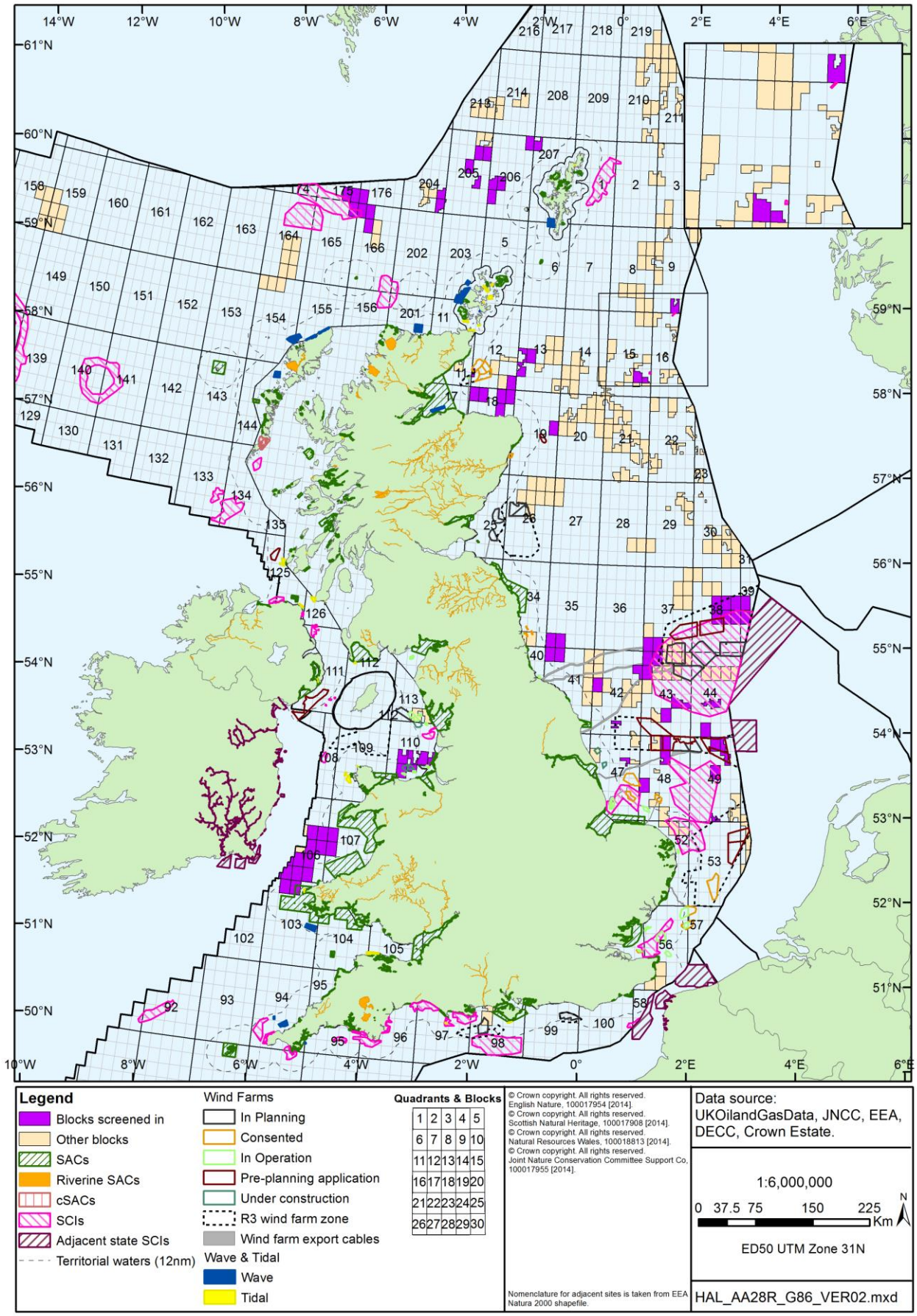


Figure 5.17: Aggregate extraction, SPAs and 28th Round Blocks

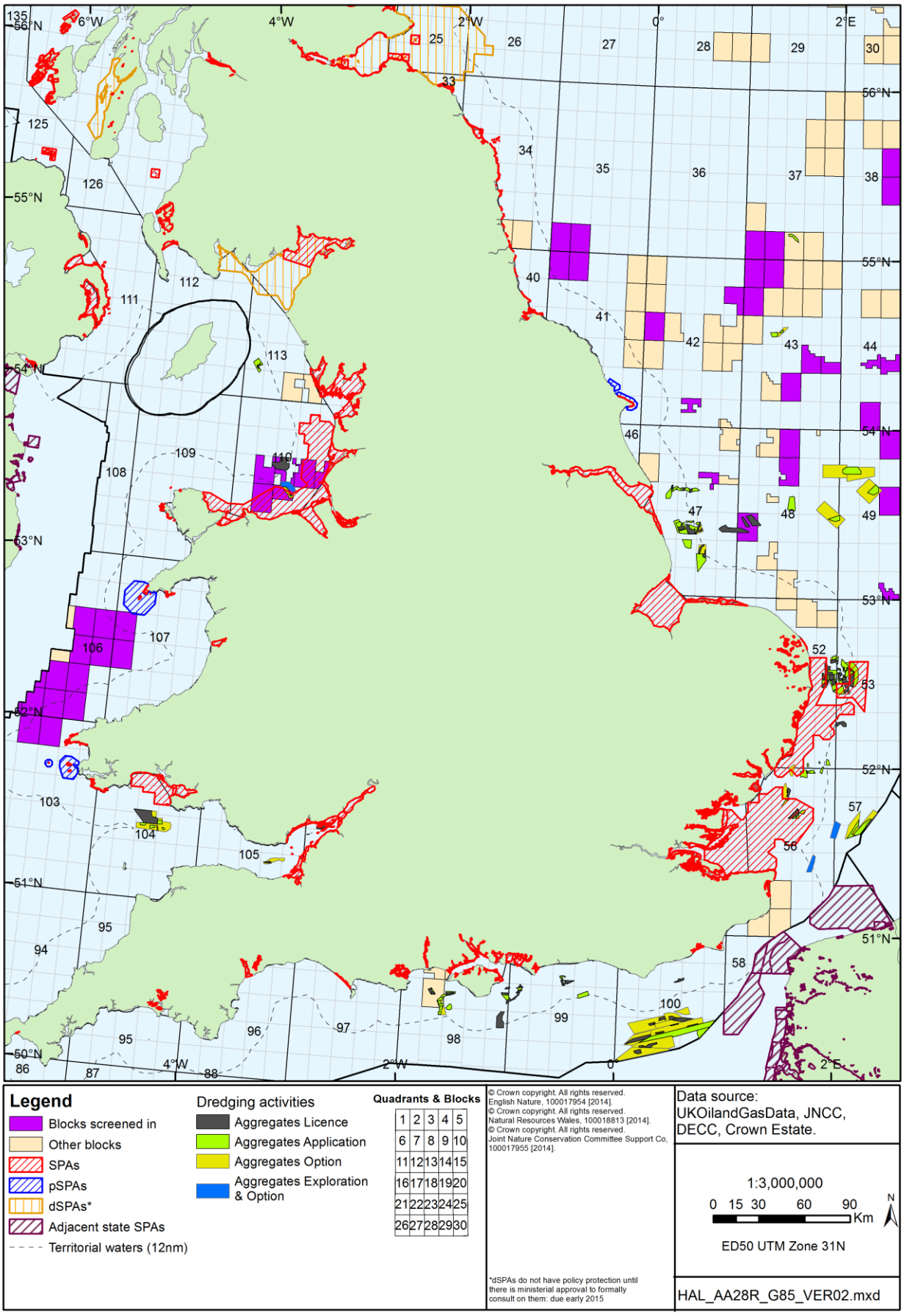


Figure 5.18: Aggregate extraction, SACs and 28th Round Blocks

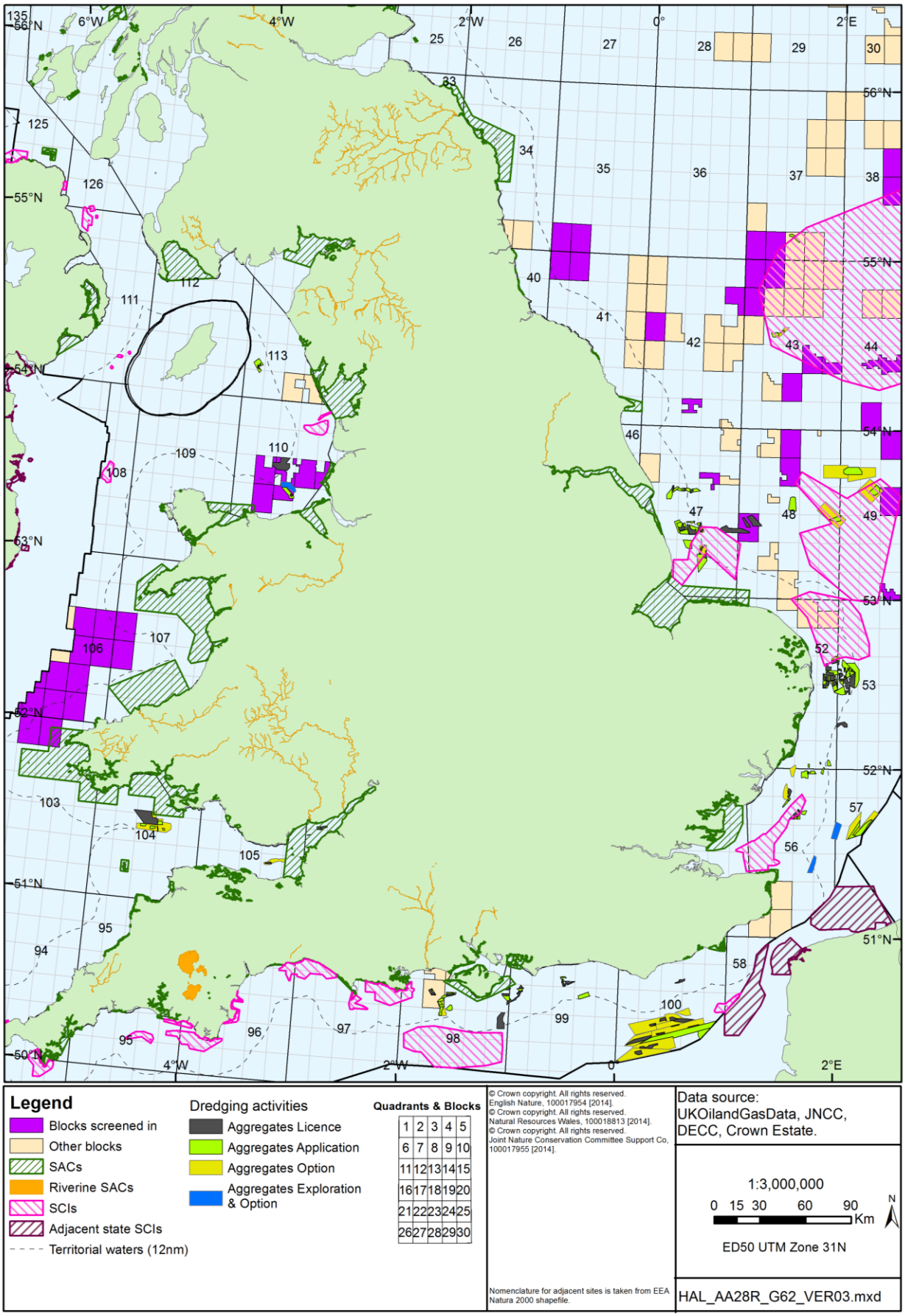


Figure 5.19: Navigation density, SPAs and 28th Round Blocks

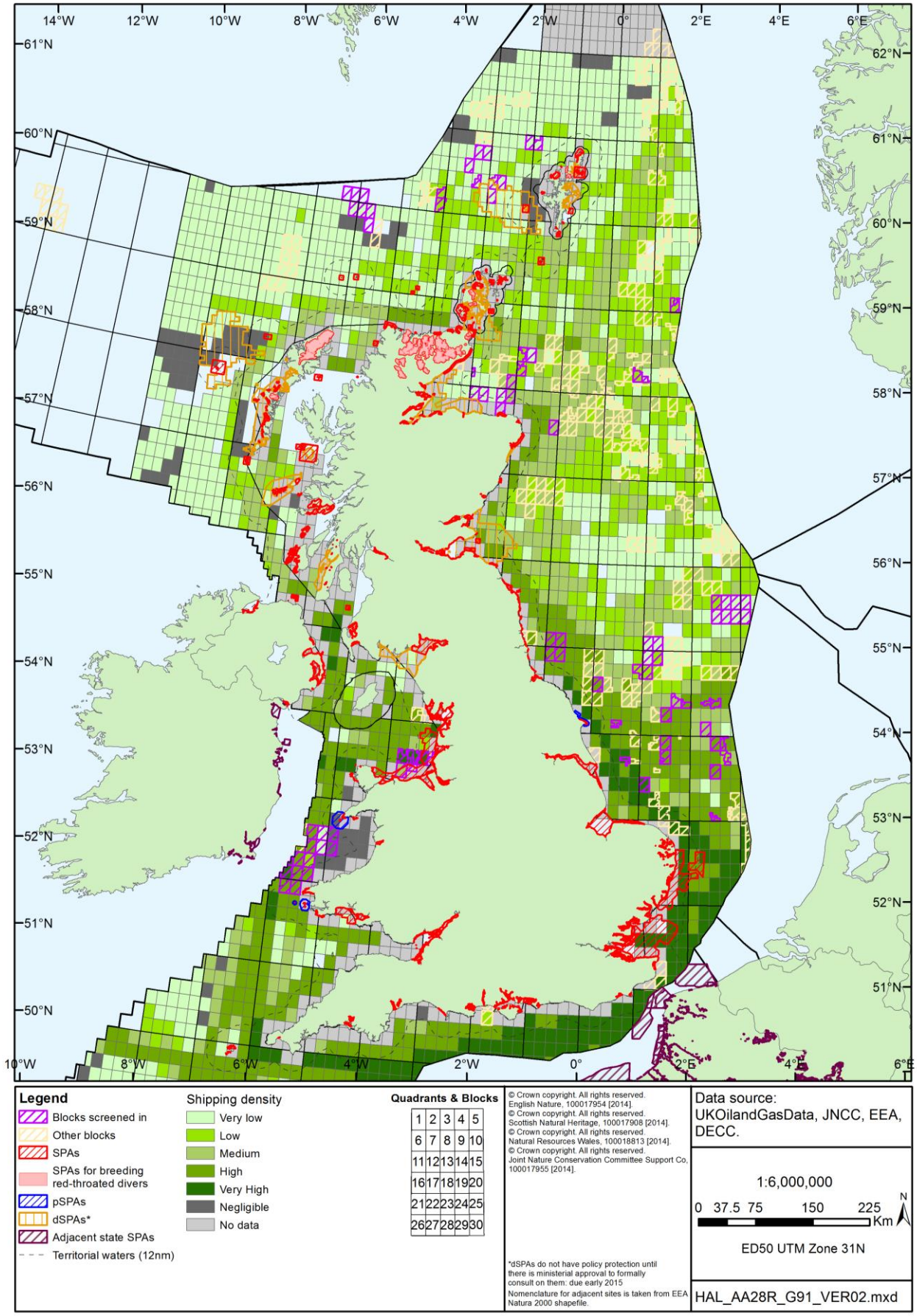
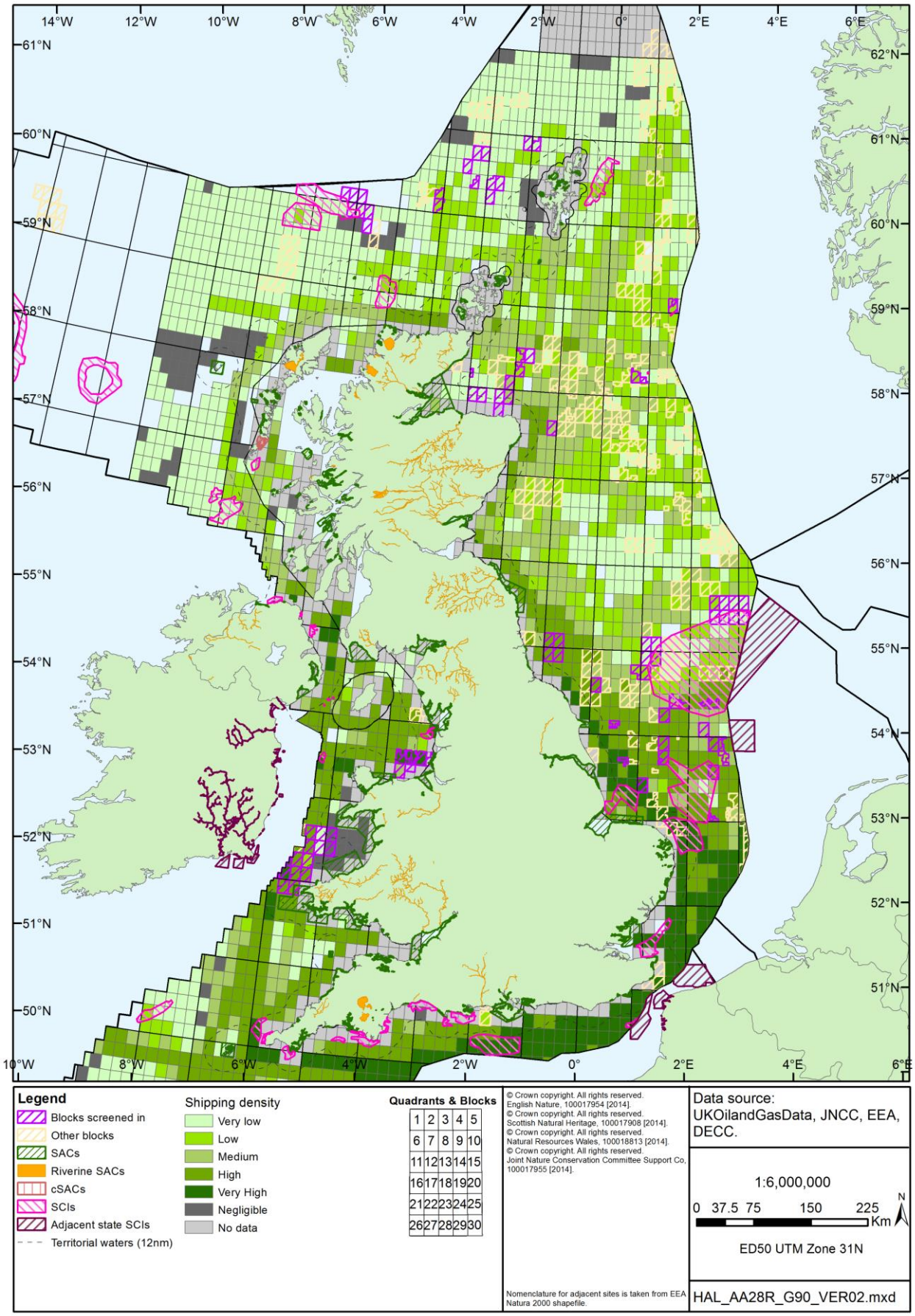


Figure 5.20: Navigation density, SACs and 28th Round Blocks



6 Conclusion

This screening assessment is based on the Blocks applied for in the 28th 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 specific activity permitting and HRA (where appropriate) to ensure appropriate mitigation measures are applied to planned operations and the prevention of potential for accidents. However, based on the screening results (Blocks screened in are shown in Figures 5.1 and 5.2) a number of Blocks for which applications are being considered for Traditional or Frontier licences will be subject to a second stage of HRA prior to decisions on the grant of such licences. These Blocks are listed in Table 6.1, which also includes a number of Blocks which have been screened in based on SNCB feedback on a draft of the screening report.

Table 6.1: List of Blocks for which a 2nd Stage of HRA will be undertaken

9/28b	19/15	41/2	47/14e	106/18	110/13e	205/9
12/21d	35/26	42/10b	48/3	106/19	110/14b	205/10
12/26c	35/27	42/11	48/8b	106/20	110/15b	205/13
12/30	37/26	42/28c	48/16	106/22	110/17	205/19b
13/16b	37/27	43/1	49/3	106/23	110/18b	205/26d
13/17	38/13	43/2	49/4d	106/24	165/5	206/5
13/21c	38/14	43/6	49/9d	106/26	166/1	206/16b
15/24a	38/15	43/19b	49/13	106/27	166/2	206/17
15/25d	38/18	43/20c	49/28e	106/28	166/7	206/21
18/1	38/19	43/23	103/2	106/29	175/29	207/1b
18/2	38/20	44/17e	103/3	107/11	175/30	
18/4	39/11	44/18c	106/13	107/16	176/26	
18/5	39/16	44/27	106/14	110/12b	204/25c	
18/9	41/1	47/9d	106/15	110/13c	204/30b	

In addition, a number of Blocks were screened out on the basis that only Promote licence(s) (which do not allow field operations to be carried out) were being considered (see Section 2.2). For the Promote licence Blocks listed in Table 2.1, should applications be received in the future such that they may progress to allow field activities, the Department will undertake HRA for the potential for likely significant effects on European sites in advance of any such decisions.

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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 applied for as part of the 28th Licensing Round.

The primary sources of site data were the latest JNCC SAC[30] (version as of 1st September 2014) and SPA[31] (version as of 1st September 2014) 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)[32], Natural England[33], Natural Resources Wales (NRW)[34] and Department of Environment Northern Ireland (DoENI)[35].

The sites in this Appendix are ordered thus:

A2 Coastal and marine Special Protection Areas

A3 Special Protection Areas for breeding red-throated diver

A4 Coastal and marine Special Areas of Conservation

A5 Offshore Special Areas of Conservation

A6 Riverine and freshwater Special Areas of Conservation

A7 Sites in the adjacent waters of other member states

A2 Coastal and Marine Special Protection Areas[36]

Special Protection Areas (SPAs) are protected sites classified in accordance with Article 4 of the EC Birds Directive of 1979. 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

[30] Version as of 1st September 2014 - http://jncc.defra.gov.uk/page-1461
[31] Version as of 1st September 2014 - http://jncc.defra.gov.uk/page-1409
[32] http://gateway.snh.gov.uk/sitelink/index.jsp
[33] http://www.naturalengland.org.uk/ourwork/conservation/designations/default.aspx
[34] http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/designated-sites-search.aspx
[35] http://www.doeni.gov.uk/niea/protected_areas_home/natura_2000.htm
[36] Note: The tables also include a number of inland SPAs supporting breeding red-throated divers.

of inshore marine SPAs, some of which provide marine extensions to existing sites, are presently at the draft stage in Scottish inshore and offshore waters. These dSPAs[37], though not formally subject to Government approval and yet to be formally consulted upon, are listed and shown in relevant maps below. A number of additional sites are in the process of being classified in English and Welsh waters, and these are known as potential SPAs (pSPAs).

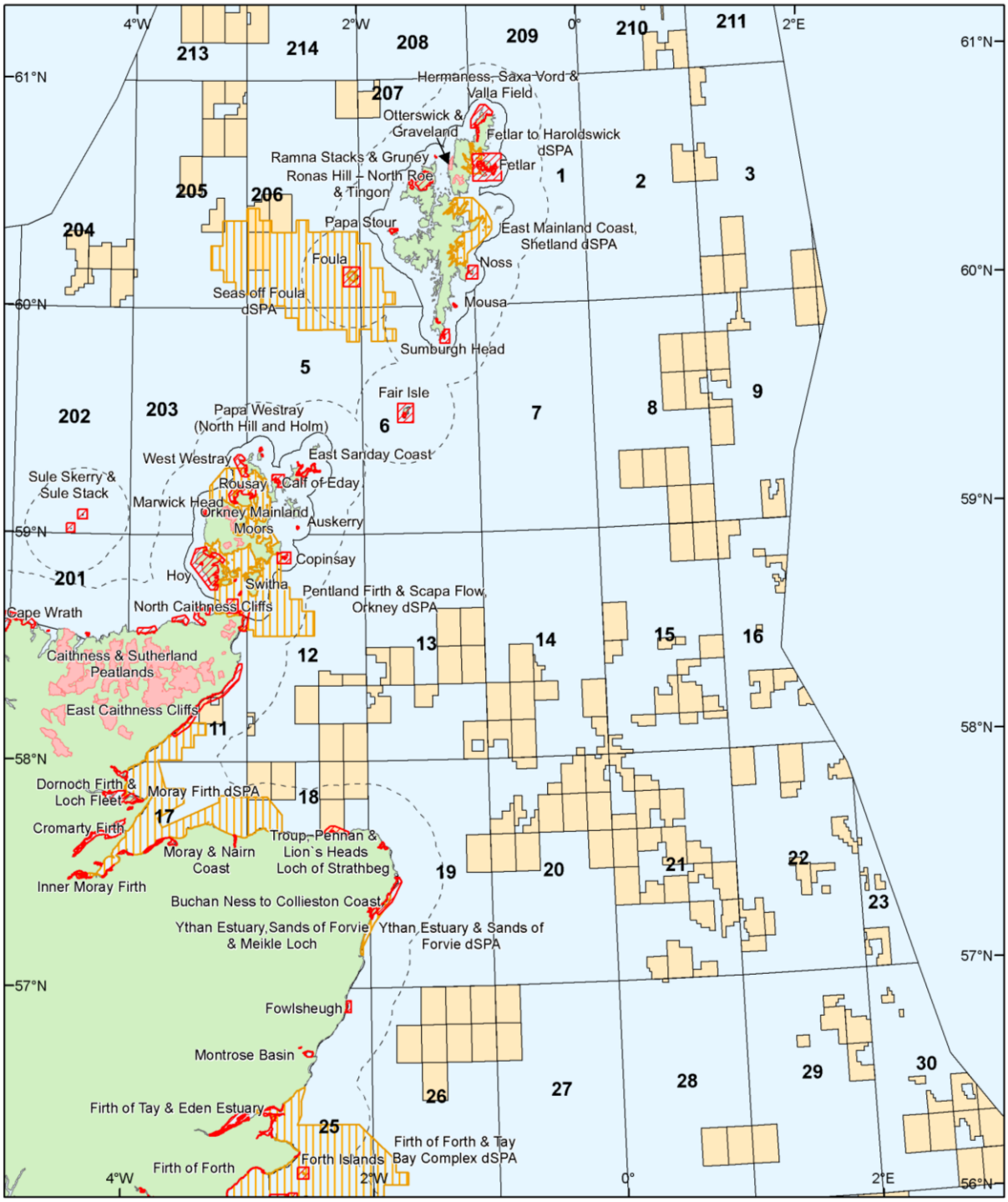
Box A.1: Migratory and/or Annex I bird species for which SPAs are selected in the UK

Divers and grebes	**Waders**
Red-throated diver *Gavia stellata*	Oystercatcher *Haematopus ostralegus*
Black-throated diver *Gavia arctica*	Avocet *Recurvirostra avosetta*
Little grebe *Tachybaptus ruficollis*	Stone curlew *Burhinus oedicnemus*
Great crested grebe *Podiceps cristatus*	Ringed plover *Charadrius hiaticula*
Slavonian grebe *Podiceps auritus*	Dotterel *Charadrius morinellus*
Seabirds	Golden plover *Pluvialis apricaria*
Fulmar *Fulmarus glacialis*	Grey plover *Pluvialis squatarola*
Manx shearwater *Puffinus puffinus*	Lapwing *Vanellus vanellus*
Storm petrel *Hydrobates pelagicus*	Knot *Calidris canutus*
Leach's petrel *Oceanodroma leucorhoa*	Sanderling *Calidris alba*
Gannet *Morus bassanus*	Purple sandpiper *Calidris maritima*
Cormorant *Phalacrocorax carbo carbo*	Dunlin *Calidris alpina alpina*
Shag *Phalacrocorax aristotelis*	Ruff *Philomachus pugnax*
Guillemot *Uria aalge*	Snipe *Gallinago gallinago*
Black guillemot *Cepphus grylle*	Black-tailed godwit *Limosa limosa* (breeding)
Razorbill *Alca torda*	Black-tailed godwit *Limosa limosa islandica* (non-breeding)
Puffin *Fratercula arctica*	
Gulls, terns and skuas	Bar-tailed godwit *Limosa lapponica*
Arctic skua *Stercorarius parasiticus*	Whimbrel *Numenius phaeopus*
Great skua *Catharacta skua*	Curlew *Numenius arquata*
Mediterranean gull *Larus melanocephalus*	Redshank *Tringa totanus*
Black-headed gull *Larus ridibundus*	Greenshank *Tringa nebularia*
Common gull *Larus canus*	Wood sandpiper *Tringa glareola*
Lesser black-backed gull *Larus fuscus*	Turnstone *Arenaria interpres*
Herring gull *Larus argentatus*	Red-necked phalarope *Phalaropus lobatus*
Great black-backed gull *Larus marinus*	Little egret *Egretta garzetta*
Kittiwake *Rissa tridactyla*	**Waterfowl**
Sandwich tern *Sterna sandvicensis*	Bewick's swan *Cygnus columbianus bewickii*
Roseate tern *Sterna dougallii*	Whooper swan *Cygnus cygnus*
Common tern *Sterna hirundo*	Bean goose *Anser fabalis*
Arctic tern *Sterna paradisaea*	Pink-footed goose *Anser brachyrhynchus*
Little tern *Sterna albifrons*	Russian white-fronted goose *Anser albifrons albifrons*
Crakes and rails	Greenland white-fronted goose *Anser albifrons flavirostris*
Spotted crake *Porzana porzana*	Icelandic greylag goose *Anser anser*
Corncrake *Crex crex*	Greenland barnacle goose *Branta leucopsis*

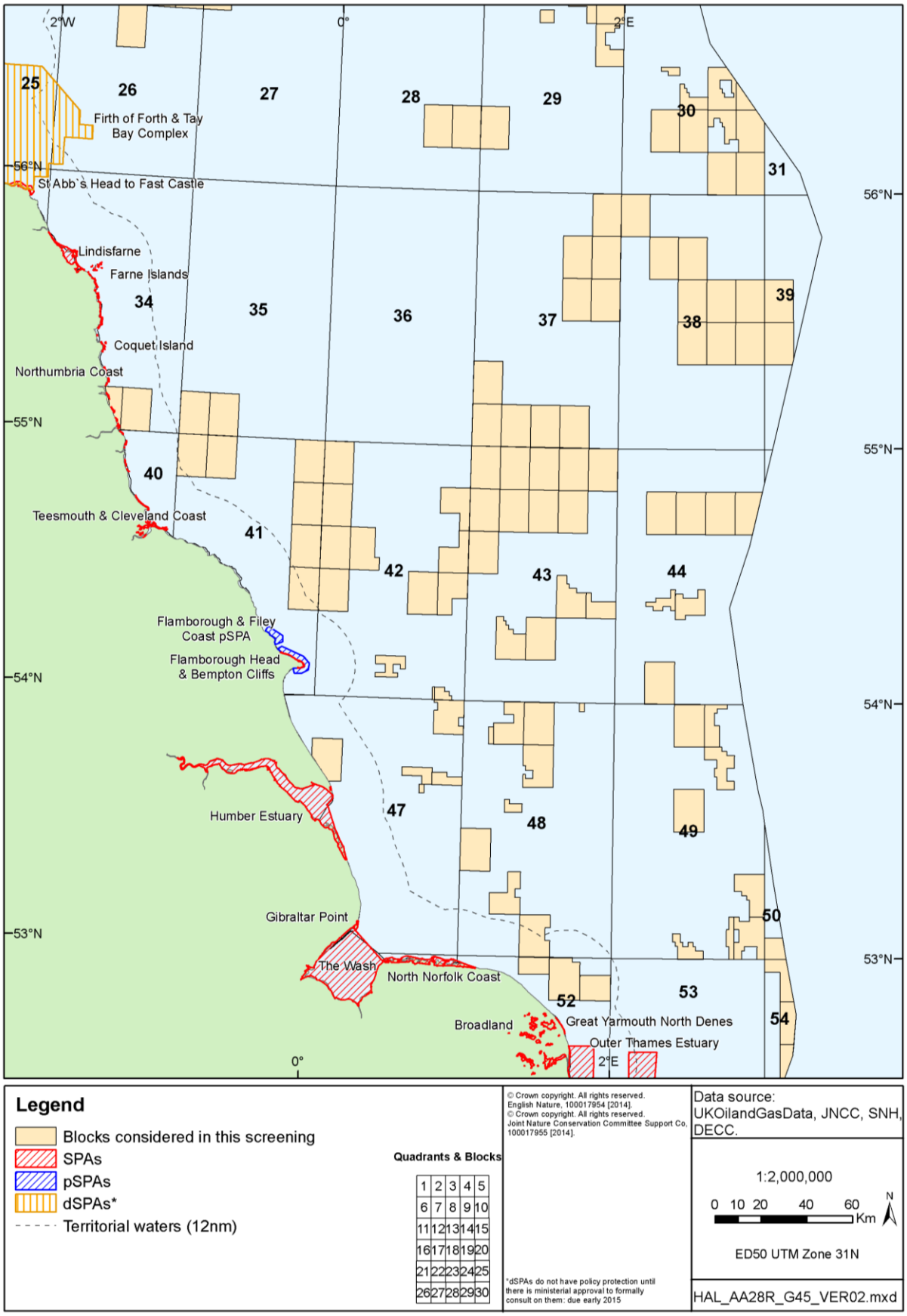
[37] http://www.snh.gov.uk/docs/A1350044.pdf - 22nd July 2014

Coot *Fulica atra*	Svalbard barnacle goose *Branta leucopsis*
Bittern *Botaurus stellaris*	Dark-bellied brent goose *Branta bernicla bernicla*
Birds of prey and owls	Light-bellied brent goose *Branta bernicla hrota*
Honey buzzard *Pernis apivorus*	Shelduck *Tadorna tadorna*
Red kite *Milvus milvus*	Widgeon *Anas penelope*
Marsh harrier *Circus aeruginosus*	Gadwall *Anas strepera*
Hen harrier *Circus cyaneus*	Teal *Anas crecca*
Golden eagle *Aquila chrysaetos*	Mallard *Anas platyrhynchos*
Osprey *Pandion haliaetus*	Pintail *Anas acuta*
Merlin *Falco columbarius*	Shoveler *Anas clypeata*
Peregrine *Falco peregrinus*	Pochard *Aythya ferina*
Short-eared owl *Asio flammeus*	Tufted duck *Aythya fuligula*
Other bird species	Scaup *Aythya marila*
Capercaillie *Tetrao urogallus*	Eider *Somateria mollissima*
Nightjar *Caprimulgus europaeus*	Long-tailed duck *Clangula hyemalis*
Woodlark *Lullula arborea*	Common scoter *Melanitta nigra*
Fair Isle wren *Troglodytes troglodytes fridariensis*	Velvet scoter *Melanitta fusca*
Aquatic warbler *Acrocephalus paludicola*	Goldeneye *Bucephala clangula*
Dartford warbler *Sylvia undata*	Red-breasted merganser *Mergus serrator*
Chough *Pyrrhocorax pyrrhocorax*	Goosander *Mergus merganser*
Scottish crossbill *Loxia scotica*	

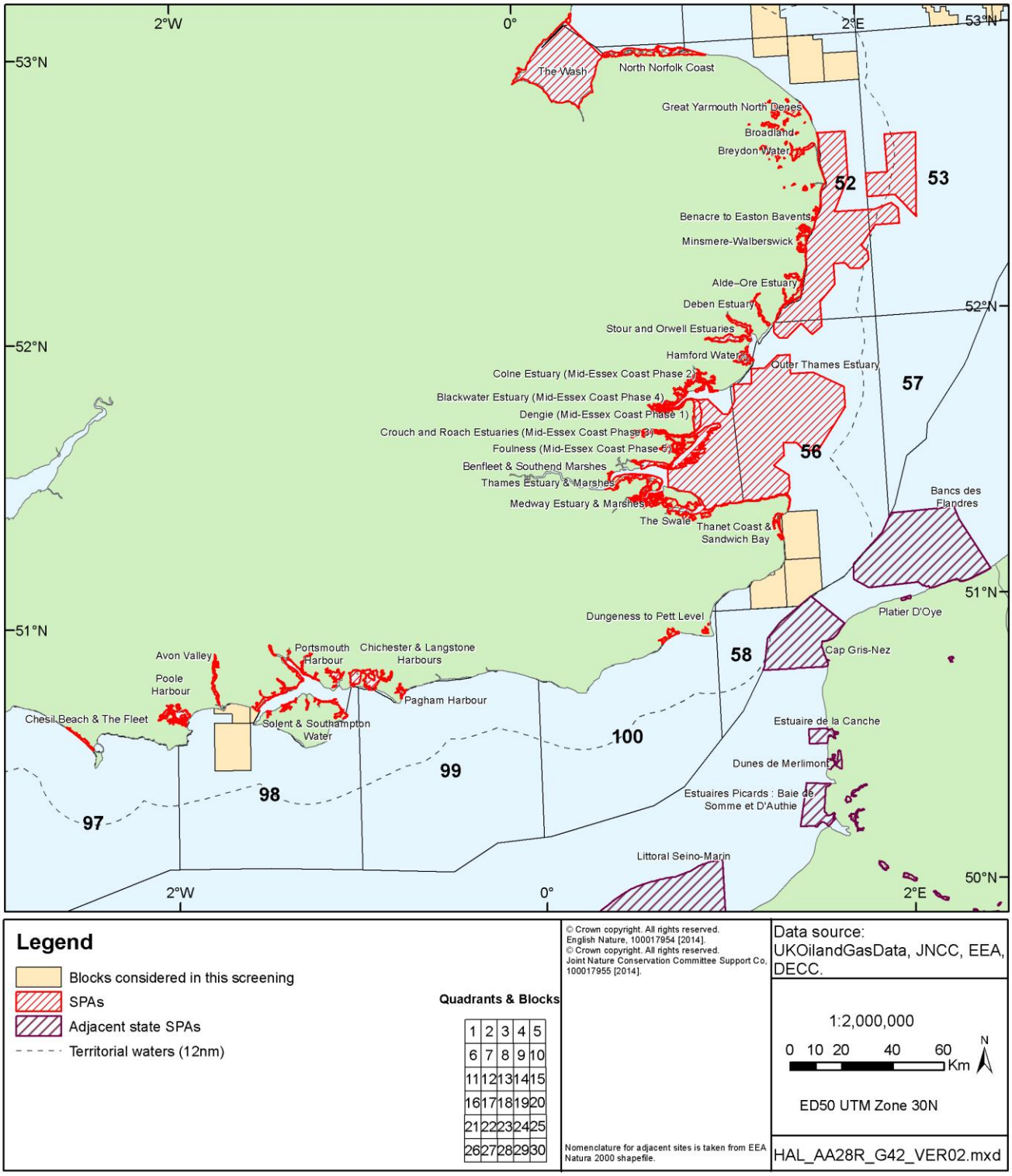
Map A.1: Location of SPAs – Shetland to the Forth



Map A.2: Location of SPAs – Berwickshire to Norfolk



Map A.3: Location of SPAs – Norfolk to Dorset



Legend

- Blocks considered in this screening
- SPAs
- Adjacent state SPAs
- 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

Nomenclature for adjacent sites is taken from EEA Natura 2000 shapefile.

Data source: UKOilandGasData, JNCC, EEA, DECC.

1:2,000,000

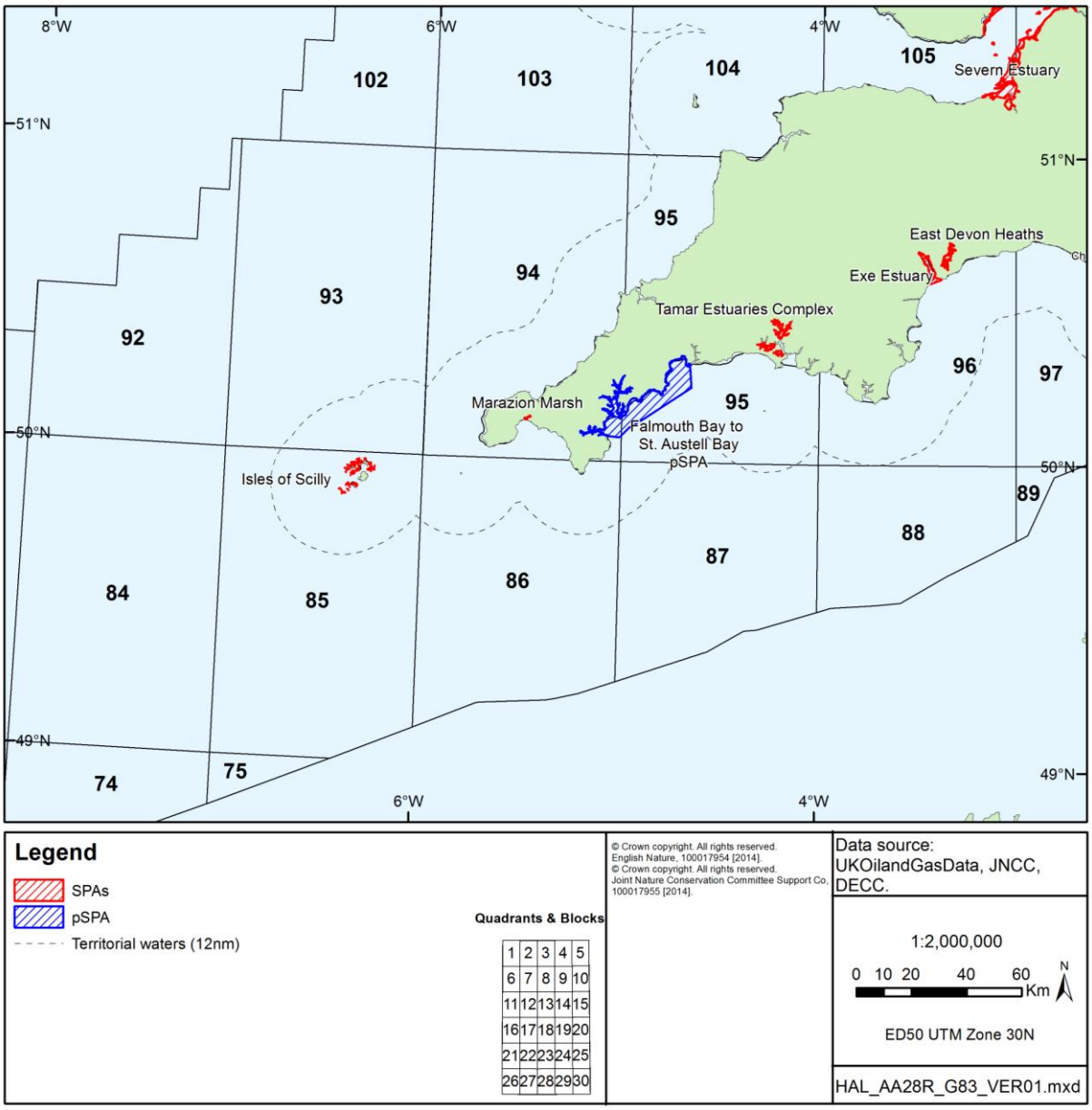
0 10 20 40 60 Km

N

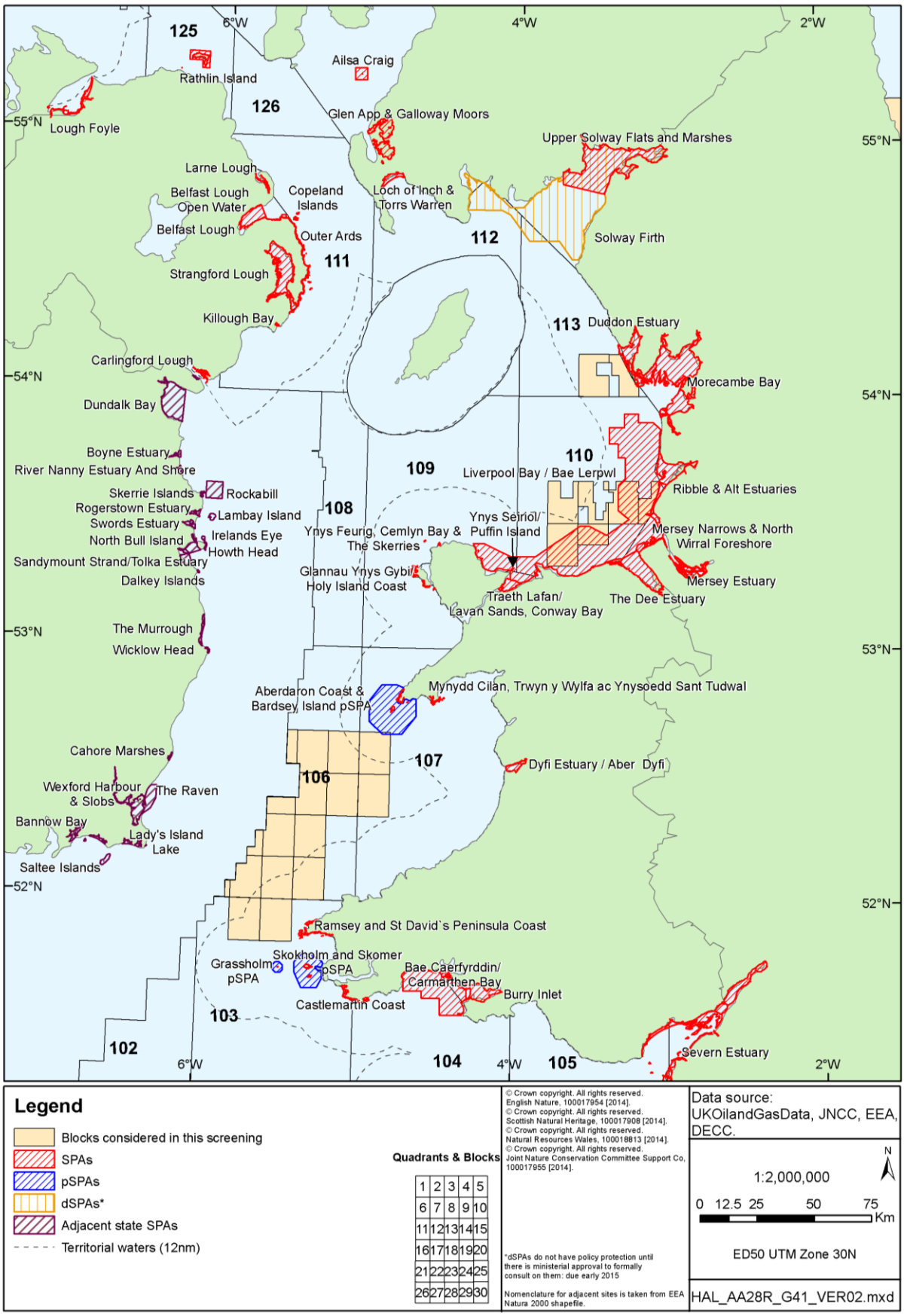
ED50 UTM Zone 30N

HAL_AA28R_G42_VER02.mxd

Map A.4: Location of SPAs – Lyme Bay to the Severn



Map A.5: Location of SPAs – Severn to Mull of Kintyre



Map A.6: Location of SPAs – Scottish west coast and Islands

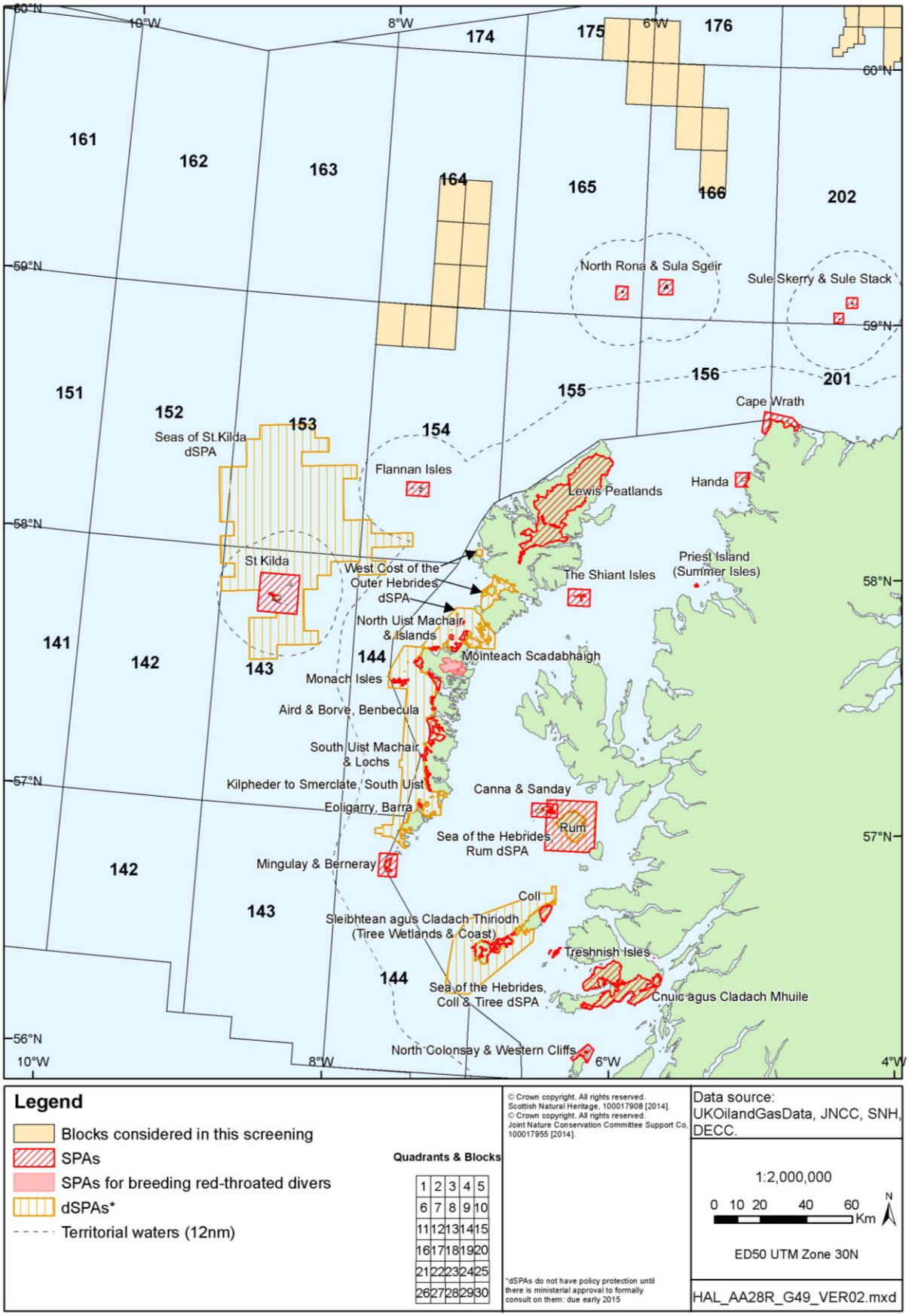


Table A.1: SPAs from Shetland to Kent and their Qualifying Features (North Sea)

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
SHETLAND				
Sumburgh Head SPA	2477.91	Breeding: Arctic tern	N/A	Breeding: Seabirds
Lochs of Spiggie and Brow SPA	141.48	Over winter: Whooper swan	N/A	N/A
Foula SPA	7985.49	Breeding: Arctic tern Leach's storm petrel Red-throated diver	Breeding: Great skua Guillemot Puffin Shag	Breeding: Seabirds
Papa Stour SPA	569.03	Breeding: Arctic tern	Breeding: Ringed plover	N/A
Ronas Hill-North Roe and Tingon SPA	5470.2	Breeding: Red-throated diver Merlin	Breeding: Great skua	N/A
Ramna Stacks and Gruney SPA	11.59	Breeding: Leach's storm petrel	N/A	N/A
Otterswick and Graveland SPA	2241.41	Breeding: Red-throated diver	N/A	N/A
Hermaness, Saxa Vord and Valla Field SPA	6833.04	Breeding: Red-throated diver	Breeding: Gannet Great skua Puffin	Breeding: Seabirds
Fetlar SPA	16962.16	Breeding: Arctic tern Red-necked phalarope	Breeding: Dunlin Great skua Whimbrel	Breeding: Seabirds
Noss SPA	3338.34	N/A	Breeding: Gannet Great skua Guillemot	Breeding: Seabirds
Mousa SPA	197.98	Breeding: Arctic tern Storm petrel	N/A	N/A
Fair Isle SPA	6824.40	Breeding: Arctic tern Fair Isle wren	Breeding: Guillemot	Breeding: Seabirds
Seas off Foula marine dSPA	-	N/A	Great skua Fulmar Arctic skua Guillemot Puffin	N/A
Fetlar marine dSPA	-	Red-throated diver	N/A	N/A

[38] 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[38]
East Mainland Coast, Shetland marine dSPA	-	Great northern diver Red-throated diver Slavonian grebe	Common eider Long-tailed duck Red-breasted merganser	N/A
ORKNEY				
Pentland Firth Islands SPA	170.51	Breeding: Arctic tern	N/A	N/A
Switha SPA	57.39	Over winter: Barnacle goose	N/A	N/A
Hoy SPA	18122.17	Breeding: Peregrine Red-throated diver	Breeding: Great skua	Breeding: Seabirds
Marwick Head SPA	475.58	N/A	Breeding: Guillemot	Breeding: Seabirds
Rousay SPA	5483.37	Breeding: Arctic tern	N/A	Breeding: Seabirds
West Westray SPA	3781.29	Breeding: Arctic tern	Breeding: Guillemot	Breeding: Seabirds
Papa Westray (North Hill and Holm) SPA	245.71	Breeding: Arctic tern	Breeding: Arctic Skua	N/A
Calf of Eday SPA	2668.91	N/A	N/A	Breeding: Seabirds
East Sanday Coast SPA	1515.23	Over winter: Bar-tailed Godwit	Over winter: Purple sandpiper Turnstone	N/A
Auskerry SPA	101.97	Breeding: Arctic tern Storm petrel	N/A	N/A
Copinsay SPA	3607.7	N/A	N/A	Breeding: Seabirds
Sule Skerry and Sule Stack SPA	3909.45	Breeding: Leach's storm petrel Storm petrel	Breeding: Gannet Puffin	Breeding: Seabird
North Orkney marine dSPA	-	Great northern diver Slavonian grebe Red-throated diver Arctic tern	Common eider Long-tailed duck Velvet Scoter Red-breasted merganser Shag	N/A
Pentland Firth & Scapa Flow marine dSPA	-	Great northern diver Red-throated diver Black-throated diver Slavonian grebe Arctic tern	Shag Guillemot Common eider Long-tailed duck Goldeneye Red-breasted merganser	N/A
NORTH COAST OF SCOTLAND				
North Caithness Cliffs SPA	14621.14	Breeding: Peregrine	Breeding: Guillemot	Breeding: Seabird
North Sutherland Coastal Islands SPA	221.11	Over winter: Barnacle goose	N/A	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
MORAY FIRTH AND ABERDEENSHIRE				
East Caithness Cliffs SPA	11690.92	Breeding: Peregrine	Breeding: Razorbill Herring gull Shag Kittiwake Guillemot	Breeding: Seabird
Dornoch Firth and Loch Fleet SPA	7836.33	Breeding: Osprey Over winter: Bar-tailed godwit	Over winter: Greylag goose Widgeon	Over winter: Waterfowl
Loch Eye SPA	205.14	Over winter: Whooper swan	Over winter: Greylag goose	N/A
Cromarty Firth SPA	3746.95	Breeding: Common tern Osprey Over winter: Bar-tailed godwit Whooper swan	Over winter: Greylag goose	Over winter: Waterfowl
Inner Moray Firth SPA	2339.23	Breeding: Common tern Osprey Over winter: Bar-tailed godwit	Over winter: Greylag goose Red-breasted merganser Redshank Scaup	Over winter: Waterfowl
Moray and Nairn Coast SPA	2410.25	Breeding: Osprey Over winter: Bar-tailed godwit	Over winter: Greylag goose Pink-footed goose Redshank	Over winter: Waterfowl
Troup, Pennan and Lion's Heads SPA	3367.21	N/A	Breeding: Guillemot Kittiwake	Breeding: Seabirds
Loch of Strathbeg SPA	615.94	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	5400.94	N/A	N/A	Breeding: Seabirds
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	1016.24	Breeding: Common tern Little tern Sandwich tern	Over winter: Pink-footed goose	Over winter: Waterfowl
Fowlsheugh SPA	1303.54	N/A	N/A	Breeding: Seabirds

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
Moray Firth marine dSPA	-	Great northern diver Red-throated diver Slavonian grebe	Scaup Common eider Long-tailed duck Common scoter Velvet scoter Common goldeneye Red-breasted merganser Shag	N/A
Ythan Estuary marine dSPA	-	Sandwich tern Little tern	N/A	N/A
SOUTH OF ABERDEENSHIRE				
Montrose Basin SPA	984.61	N/A	Over winter: Greylag goose Knot Pink-footed goose Oystercatcher Redshank	Over winter: Waterfowl
Firth of Tay and Eden Estuary SPA	6923.29	Breeding: Little tern Marsh harrier Over winter: Bar-tailed godwit	Over winter: Greylag goose Pink-footed goose Redshank	Over winter: Waterfowl
Forth Islands SPA	9796.98	Breeding: Roseate tern Common tern Sandwich tern Arctic tern	Breeding: Puffin Lesser black-backed gull Gannet Shag	Breeding: Seabirds
Firth of Forth SPA	6313.72	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	1736.52	N/A	N/A	Breeding: Seabirds

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
Firth of Forth and Tay Bay Complex marine dSPA	-	Red-throated diver Slavonian grebe Little Gull Common tern Arctic tern	Common eider Long-tailed duck Common Scoter Velvet scoter Goldeneye Red-breasted merganser Northern gannet Manx shearwater European shag Black-legged kittiwake Common guillemot Razorbill Atlantic puffin Black-headed gull Common gull Herring gull	N/A
NORTHEAST ENGLAND				
Lindisfarne SPA	3679.22	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	101.86	Breeding: Arctic tern Common tern Roseate tern Sandwich tern	Breeding: Guillemot Puffin	Breeding: Seabirds
Northumbria Coast SPA	1107.98	Breeding: Little tern	Over winter: Purple sandpiper Turnstone	N/A
Coquet Island SPA	22.28	Breeding: Arctic tern Common tern Roseate tern Sandwich tern	Breeding: Puffin	Breeding: Seabirds
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
YORKSHIRE AND HUMBER				
Flamborough Head and Bempton Cliffs SPA	212.17	N/A	Breeding: Kittiwake	Breeding: Seabirds

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
Flamborough and Filey Coast pSPA	8039.6	N/A	Kittiwake Gannet Guillemot Razorbill	Breeding: Seabirds
Humber Estuary SPA	37630.24	Breeding: Bittern Marsh harrier Avocet Little tern Over winter: Bittern Hen harrier Bar-tailed godwit Golden plover Avocet On passage: Ruff	Over winter: Dunlin Knot Black-tailed godwit Shelduck Redshank On passage: Dunlin Knot Black-tailed godwit Redshank	Non-breeding: Waterfowl
LICOLNSHIRE, NORFOLK AND SUFFOLK				
Gibraltar Point SPA	414.09	Breeding: Little tern Over winter: Bar-tailed godwit	Over winter: Grey plover Sanderling Knot	Over winter: Waterfowl
The Wash SPA	62211.66	Breeding: Common tern Little tern Marsh harrier Over winter: Avocet Bar-tailed godwit Golden plover Whooper swan	On passage: Ringed plover Sanderling Over winter: Black-tailed godwit Curlew Dark-bellied brent goose Dunlin Grey plover Knot Oystercatcher Pink-footed goose Pintail Redshank Shelduck Turnstone	Over winter: Waterfowl

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
North Norfolk Coast SPA	7886.79	Breeding: Avocet Bittern Common tern Little tern Marsh harrier Mediterranean gull Roseate tern Sandwich tern Over winter: Avocet Bar-tailed godwit Bittern Golden plover Hen harrier Ruff	Breeding: Redshank Ringed plover On passage: Ringed plover Over winter: Dark-bellied brent goose Knot Pink-footed goose Pintail Redshank Widgeon	Over winter: Waterfowl
Broadland SPA	5462.4	Breeding: Bittern Marsh harrier Over winter: Bittern Ruff Bewick's swan Whooper swan Widgeon Hen harrier	Over winter: Gadwall Pink-footed goose Shoveler	Over winter: Waterfowl
Great Yarmouth North Denes SPA	149.19	Breeding: Little tern	N/A	N/A
Breydon Water SPA	1202.94	Breeding: Common tern Over winter: Bewick's swan Avocet Golden plover On passage: Ruff	Over winter: Lapwing	Over winter: Waterfowl
Benacre to Easton Bavents SPA	516.83	Breeding: Bittern Little tern Marsh harrier Over winter: Bittern	N/A	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
Minsmere-Walberswick SPA	2018.92	Breeding: Bittern Nightjar Marsh harrier Avocet Little tern Woodlark Over winter: Hen harrier Avocet Bittern	Breeding: Shoveler Teal Gadwall Over winter: Shoveler Gadwall Russian white-fronted goose	N/A
Alde-Ore Estuary SPA	2416.87	Breeding: Marsh harrier Avocet Little tern Sandwich tern Over winter: Ruff Avocet	Breeding: Lesser black-backed gull Over winter: Redshank	Breeding: Seabirds Over winter: Waterfowl
Deben Estuary SPA	978.93	Over winter: Avocet	Over winter: Dark-bellied brent goose	N/A
Stour and Orwell Estuaries SPA	3676.92	Breeding: Avocet Over winter: Hen harrier	Over winter: Pintail Dark-bellied brent goose Knot Dunlin Black-tailed godwit Grey plover Redshank Shelduck Turnstone On passage: Redshank	Over winter: Waterfowl
ESSEX AND KENT				
Outer Thames Estuary (Margate and Long Sands) SPA	379,268.14	Over winter: Red-throated diver	N/A	N/A
Hamford Water SPA	2187.21	Breeding: Little tern Over winter: Avocet Golden plover Ruff	Over winter: Teal Dark-bellied brent goose Ringed plover Black-tailed godwit Grey plover Shelduck Redshank On passage: Ringed plover	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
Foulness (Mid-Essex Coast Phase 5) SPA	10968.9	Breeding: Avocet Little tern Common tern Sandwich tern Over winter: Hen harrier Bar-tailed godwit Avocet Golden plover	Breeding: Ringed plover Over winter: Dark-bellied brent goose Knot Oystercatcher Grey plover Redshank	Over winter: Waterfowl
Colne Estuary (Mid-Essex Coast Phase 2) SPA	2701.43	Breeding: Little tern Over winter: Hen harrier Avocet Golden plover	Breeding: Pochard Ringed plover Over winter: Dark-bellied brent goose Redshank	Over winter: Waterfowl
Medway Estuary and Marshes SPA	4684.36	Breeding: Avocet Little tern Over winter: Avocet	Over winter: Pintail Dark-bellied brent goose Dunlin Knot Ringed plover Black-tailed godwit Grey plover Shelduck Redshank	Breeding: Kingfisher Mallard Short-eared owl Pochard Hen harrier Merlin Red-throated diver Cormorant Lapwing Over winter: Waterfowl
Benfleet and Southend Marshes SPA	2251.31	N/A	Over winter: Dark-bellied brent goose Dunlin Knot Ringed plover Grey plover On passage: Ringed plover	Over winter: Waterfowl
Dengie (Mid-Essex Coast Phase 1) SPA	3127.23	Over winter: Hen harrier Bar-tailed godwit	Over winter: Dark-bellied brent goose Knot Grey plover	Over winter: Waterfowl
Thanet Coast and Sandwich Bay SPA	1870.16	Breeding: Little tern Over winter: Golden plover	Over winter: Turnstone	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[38]
Thames Estuary and Marshes SPA	4838.94	Over winter: Hen harrier Avocet	Over winter: Dunlin Knot Black-tailed godwit Grey plover Redshank On passage: Ringed plover	Over winter: Waterfowl
Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA	1735.58	Over winter: Hen harrier	Over winter: Dark-bellied brent goose	Over winter: Waterfowl
The Swale SPA	6514.71	Breeding: Avocet Marsh harrier Mediterranean gull Over winter: Avocet Bar-tailed godwit Golden plover Hen harrier	Over winter: Dark-bellied brent goose Dunlin Redshank Black-tailed godwit Grey plover Knot Pintail Shoveler On passage: Ringed plover	Over winter: Waterfowl Breeding: Reed warbler Teal Mallard Gadwall Ringed plover Reed bunting Coot Moorhen Oystercatcher Curlew Grey plover Shelduck Redshank Lapwing
Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	4395.15	Breeding: Little tern Over winter: Hen harrier Avocet Golden plover Ruff	Breeding: Pochard Ringed plover Over winter: Dark-bellied brent goose Dunlin Ringed plover Black-tailed godwit Grey plover Redshank Shelduck On passage: Ringed plover	Over winter: Waterfowl
Dungeness to Pett Level SPA	1474.04	Breeding: Common tern Little tern Mediterranean gull Over winter: Bewick's swan On passage: Aquatic warbler	Over winter: Shoveler	N/A

Table A.2: SPAs from Sutherland to Severn Estuary and their Qualifying Features

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[39]
WEST SCOTLAND				
Cape Wrath SPA	6737.26	N/A	N/A	Breeding: Seabirds
North Rona and Sula Sgeir SPA	6850.58	Breeding: Leach's petrel Storm petrel	Breeding: Razorbill Puffin Fulmar Great black-backed gull Gannet Kittiwake Guillemot	Breeding: Seabirds
Flannan Isles SPA	5832.82	Breeding: Leach's petrel	N/A	Breeding: Seabirds
St Kilda SPA	29014.62	Breeding: Leach's petrel Storm petrel	Migrating: Gannet Great skua Puffin	Breeding: Seabirds
North Uist Machair and Islands SPA	4876.35	Breeding: Corncrake Over winter: Barnacle goose	Breeding: Dunlin Ringed plover Oystercatcher Redshank Over winter: Ringed plover Turnstone Purple sandpiper	N/A
Monach Isles SPA	595.74	Breeding: Little tern Common tern Over winter: Barnacle goose	Breeding: Black guillemot	N/A
Aird and Borve, Benbecula SPA	361	Breeding: Corncrake	N/A	N/A
South Uist Machair and Lochs SPA	5017.23	Breeding: Corncrake Little tern	Breeding: Dunlin Oystercatcher Redshank Ringed plover Over winter: Ringed plover Sanderling	N/A
Kilpheder to Smerclate, South Uist SPA	380.63	Breeding: Corncrake	N/A	N/A

[39] - 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[39]
Eoligarry, Barra SPA	144.04	Breeding: Corncrake	N/A	N/A
Mingulay and Berneray SPA	7801.72	N/A	Breeding: Razorbill	Breeding: Seabirds
Handa SPA	3205.61	N/A	Breeding: Guillemot Razorbill	Breeding: Seabirds
Priest Island SPA	131.68	Breeding: Storm petrel	N/A	N/A
Shiant Isles SPA	6935.65	Over winter: Barnacle goose	Breeding: Razorbill Puffin Shag	Breeding: Seabirds
Canna and Sanday SPA	6566.8	N/A	N/A	Breeding: Seabirds
Rum SPA	46716.21	Breeding: Red throated-diver Golden eagle	Breeding: Manx shearwater	Breeding: Seabirds
Coll SPA	2321.88	Over winter: Greenland white-fronted goose Barnacle goose	N/A	N/A
Sléibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast) SPA	1938.59	Over winter: Greenland white-fronted goose Barnacle goose	Breeding: Dunlin Oystercatcher Redshank Ringed Plover Over winter: Turnstone Ringed plover	N/A
Treshnish Isles SPA	240.67	Breeding: Storm petrel Over winter: Barnacle goose	N/A	N/A
Glas Eileanan SPA	1.43	Breeding: Common tern	N/A	N/A
Cnuic agus Cladach Mhuile (Mull Coast and Hills) SPA	29248.97	Resident: Golden eagle	N/A	N/A
Oronsay and South Colonsay SPA	2016.86	Breeding: Corncrake Chough Over winter: Chough	N/A	N/A
North Colonsay and Western Cliffs SPA	3295.95	Breeding: Chough Over winter: Chough	N/A	Breeding: Seabirds
Knapdale Lochs SPA	112.39	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[39]
Gruinart Flats, Islay SPA	3261.32	Breeding: Chough Over winter: Barnacle goose Greenland white-fronted goose Chough	Over winter: Canadian light-bellied brent goose	N/A
Bridgend Flats, Islay SPA	331.16	Over winter: Barnacle goose	N/A	N/A
Rinns of Islay SPA	9407.46	Breeding: Chough Corncrake Hen harrier On passage: Whooper swan Over winter: Greenland white-fronted goose Chough	Breeding: Common scoter	N/A
Eilean na Muice Duibhe (Duich Moss), Islay SPA	576.42	Over winter: Greenland white-fronted goose	N/A	N/A
The Oa SPA	1943	Breeding: Chough	N/A	N/A
Laggan, Islay SPA	1230.02	Over winter: Barnacle goose Greenland white-fronted goose	N/A	N/A
Kintyre Goose Roosts SPA	412.37	Over winter: Greenland white-fronted goose	N/A	N/A
West Coast of the Outer Hebrides marine dSPA	-	Great northern diver Red-throated diver Black-throated diver Slavonian grebe	Common eider Long-tailed duck Red-breasted merganser	N/A
Seas off St Kilda marine dSPA	-	N/A	Northern gannet Northern fulmar European storm-petrel Common guillemot Atlantic puffin	N/A
Rum marine dSPA	-	Red-throated diver	N/A	N/A
Coll and Tiree marine dSPA	-	Great northern diver	Common eider	
Sound of Gigha marine dSPA	-	Great northern diver	Common eider Red-breasted merganser	N/A
Solway Firth marine dSPA	-	Red-throated diver	Common scoter Goosander	

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[39]
NORTH NORTHERN IRELAND				
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
Copeland Islands SPA	201.52	Breeding: Arctic tern	Breeding: Manx shearwater	N/A
Sheep Island SPA	3.5	Breeding: Cormorant	N/A	N/A
Rathlin Island SPA	3344.62	Breeding: Peregrine	Breeding: Guillemot Razorbill Kittiwake	Breeding: Seabirds
EAST NORTHERN IRELAND				
Larne Lough SPA	395.94	Breeding: Common tern Roseate tern	Over winter: Canadian light-bellied brent goose	N/A
Belfast Lough SPA	432.14	Over winter: Bar-tailed godwit	Over winter: Redshank Turnstone	Over winter: Waterfowl
Belfast Lough Open Water SPA	5592.99	N/A	Over winter: Great crested grebe	N/A
Outer Ards SPA	1410.41	Breeding: Arctic tern Over winter: Golden plover	Over winter: Canadian light-bellied brent goose Ringed plover Turnstone	N/A
Strangford Lough SPA	15580.79	Breeding: Arctic tern Common tern Sandwich tern Over winter: Bar-tailed godwit Golden plover	Over winter: Knot Canadian light-bellied brent goose Redshank Shelduck	Over winter: Waterfowl
Killough Bay SPA	104.23	N/A	Over winter: Canadian light-bellied brent goose	N/A
Carlingford Lough SPA	827.12	Breeding: Common tern Sandwich tern	Over winter: Canadian light-bellied brent goose	N/A
SOUTHWEST SCOTLAND				
Black Cart SPA	56.3	Over winter: Whooper swan	N/A	N/A
Inner Clyde Estuary SPA	1826.02	N/A	Over winter: Redshank	N/A
Ailsa Craig SPA	2759.57	N/A	Breeding: Gannet Lesser black-backed gull	Breeding: Seabirds
Glen App-Galloway Moors SPA	8942.38	Breeding: Hen harrier	N/A	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[39]
Loch of Inch & Torrs Warren SPA	2111.04	Over winter: Greenland white-fronted goose Hen harrier	N/A	N/A
Upper Solway Flats and Marshes SPA	43636.73	Over winter: Bar-tailed godwit Barnacle goose Golden plover Whooper swan	On passage: Ringed plover Over winter: Curlew Dunlin Sanderling Knot Oystercatcher Pink-footed goose Pintail Redshank Shoveler Teal Turnstone Scaup Goldeneye Grey plover Shelduck	Over winter: Waterfowl
NORTHWEST ENGLAND				
Duddon Estuary SPA	6806.3	Breeding: Sandwich tern	Over winter: Knot Pintail Redshank On passage: Ringed plover Sanderling	Over winter: Waterfowl
Morecambe Bay SPA	37404.6	Breeding: Sandwich tern Little tern Over winter: Bar-tailed godwit Golden plover	Breeding: Herring gull Lesser black backed gull On passage: Ringed plover Sanderling Over winter: Curlew Dunlin Grey plover Knot Oystercatcher Pink-footed goose Pintail Redshank Shelduck Turnstone Bar-tailed godwit	Breeding: Seabird Over winter: Waterfowl

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[39]
Ribble and Alt Estuaries SPA	12412.31	Breeding: Common tern Ruff Over winter: Bar-tailed godwit Bewick's swan Golden plover Whooper swan	Breeding: Lesser black-backed gull Black-headed gull On passage: Ringed plover Sanderling Redshank Whimbrel Over winter: Black-tailed godwit Dunlin Grey plover Knot Oystercatcher Pink-footed goose Pintail Redshank Sanderling Shelduck Teal Widgeon Scaup Common scoter Curlew Cormorant Lapwing	Breeding: Seabirds Over winter: Waterfowl
Mersey Narrows and North Wirral Foreshore SPA	2078.41	N/A	Over winter: Redshank Turnstone	Over winter: Waterfowl
Mersey Estuary SPA	5023.35	Over winter: Golden plover	On passage: Redshank Ringed plover Over winter: Dunlin Pintail Redshank Shelduck Teal Lapwing Great crested grebe Grey plover Curlew Black-tailed godwit Widgeon	Over winter: Waterfowl
Liverpool Bay SPA	170292.94	Over winter: Red-throated diver	Over winter: Common scoter	Non breeding: Waterfowl

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[39]
The Dee Estuary SPA	14291.56	Breeding: Common tern Little tern On passage: Sandwich tern Over winter: Bar-tailed godwit	On passage: Redshank Over winter: Pintail Knot Oystercatcher Turnstone Black-tailed godwit Curlew Dunlin Grey plover Redshank Shelduck	Over winter: Waterfowl
NORTH AND WEST WALES				
Traeth Lafan / Lavan Sands, Conway Bay SPA	2642.98	N/A	Over winter: Oystercatcher Curlew On passage: Great crested grebe	N/A
Ynys Seiriol / Puffin Island SPA	31.33	N/A	Breeding: Cormorant	N/A
Ynys Feurig, Cemlyn Bay and The Skerries SPA	85.98	Breeding: Arctic tern Common tern Roseate tern Sandwich tern	N/A	N/A
Glannau Ynys Gybi/Holy Island Coast SPA	608.04	Breeding: Chough Over winter: Chough	N/A	N/A
Glannau Aberdaron and Ynys Enlli/Aberdaron Coast and Bardsey Island SPA	505.03	Breeding: Chough Over winter: Chough	Breeding: Manx shearwater	N/A
Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal / Mynydd Cilan, Trwyn y Wylfa and the St Tudwal Islands SPA	372.9	Breeding: Chough Over winter: Chough	N/A	N/A
Dyfi Estuary / Aber Dyfi SPA	2056.6	Over winter: Greenland white-fronted goose	N/A	N/A
Aberdaron Coast and Bardsey Island pSPA	33942	Breeding: Chough Over winter: Chough	Breeding: Manx shearwater	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[39]
SOUTH WALES				
Ramsey and St David's Peninsula Coast SPA	845.63	Breeding: Chough Over winter: Chough	N/A	N/A
Skokholm and Skomer SPA	427.71	Breeding: Chough Short-eared owl Storm petrel	Breeding: Lesser black-backed gull Manx shearwater Puffin	Breeding: Seabirds
Grassholm SPA	10.73	N/A	Breeding: Gannet	N/A
Castlemartin Coast SPA	1122.32	Breeding: Chough Over winter: Chough	N/A	N/A
Burry Inlet SPA	6627.99	N/A	Over winter: Pintail Shoveler Teal Gadwall Dunlin Knot Oystercatcher Whimbrel Grey plover Shelduck Redshank	Over winter: Waterfowl
Bae Caerfyrddin/ Carmarthen Bay SPA	33410.03	N/A	Over winter: Common scoter	N/A
Severn Estuary SPA	24662.98	Over winter: Bewick's swan	Over winter: Gadwall Russian white-fronted goose Dunlin Shelduck Redshank Curlew Pintail On passage: Ringed plover	Over winter: Waterfowl
Grassholm pSPA	1744	N/A	Breeding: Gannet	N/A
Skokholm and Skomer pSPA	14348	Storm petrel Chough Short-eared owl	Manx shearwater Puffin Lesser blackbacked Gull	Over winter: Waterfowl Breeding: Seabirds

Table A.3: SPAs from North Devon Coast to Kent and their Qualifying Features

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[40]
CORNWALL AND DEVON				
Isles of Scilly SPA	401.64	Breeding: Storm petrel	Breeding: Lesser black-backed gull	Breeding: Seabirds
Marazion Marsh SPA	54.58	On passage: Aquatic warbler Over winter: Bittern	N/A	N/A
Tamar Estuaries Complex SPA	1955	On passage: Little egret Over winter: Avocet Little egret	N/A	N/A
Exe Estuary SPA	2345.71	Over winter: Avocet Slavonian grebe	Over winter: Dark-bellied brent goose Dunlin Eurasian oystercatcher Black-gailed godwit Grey plover	Over winter: Waterfowl
East Devon Heaths SPA	1119.94	Breeding: Dartford warbler Nightjar	N/A	N/A
SOUTH COAST				
Chesil Beach and The Fleet SPA	748.11	Breeding: Little tern	Over winter: Dark bellied brent goose	N/A
Poole Harbour SPA	2271.99	Breeding: Common tern Mediterranean gull On passage: Aquatic warbler Little egret Over winter: Avocet Little egret	Over winter: Black tailed godwit Shelduck	Over winter: Waterfowl
Avon Valley SPA	1385.08	Over winter: Bewick's swan	Over winter: Gadwall	N/A

[40] 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[40]
Solent and Southampton Water SPA	5505.86	Breeding: Common tern Little tern Mediterranean gull Roseate tern Sandwich tern	Over winter: Black tailed godwit Dark bellied brent goose Ringed plover Teal	Over winter: Waterfowl
Portsmouth Harbour SPA	1248.77	N/A	Over winter: Dark bellied brent goose Dunlin Black-tailed godwit Red-breasted merganser	N/A
Chichester and Langstone Harbours SPA	5810.03	Breeding: Little tern Sandwich tern Common tern Over winter: Bar tailed godwit Little egret On passage: Little egret	Over winter: Pintail Shoveler Teal Widgeon Turnstone Dark bellied brent goose Sanderling Dunlin Ringed plover Red-breasted merganser Curlew Grey plover Shelduck Redshank Black-tailed godwit On passage: Ringed plover	Over winter: Waterfowl
Pagham Harbour SPA	636.68	Breeding: Little tern Common tern Over winter: Ruff	Over winter: Dark-bellied Brent goose Pintail	N/A

A3 Special Protection Areas for breeding red-throated diver

The following SPAs represent those sites which are only included because they support breeding red-throated diver. The other bird species included within the site designations are listed for completeness.

Table A.4: Relevant SPAs designated for breeding red-throated diver

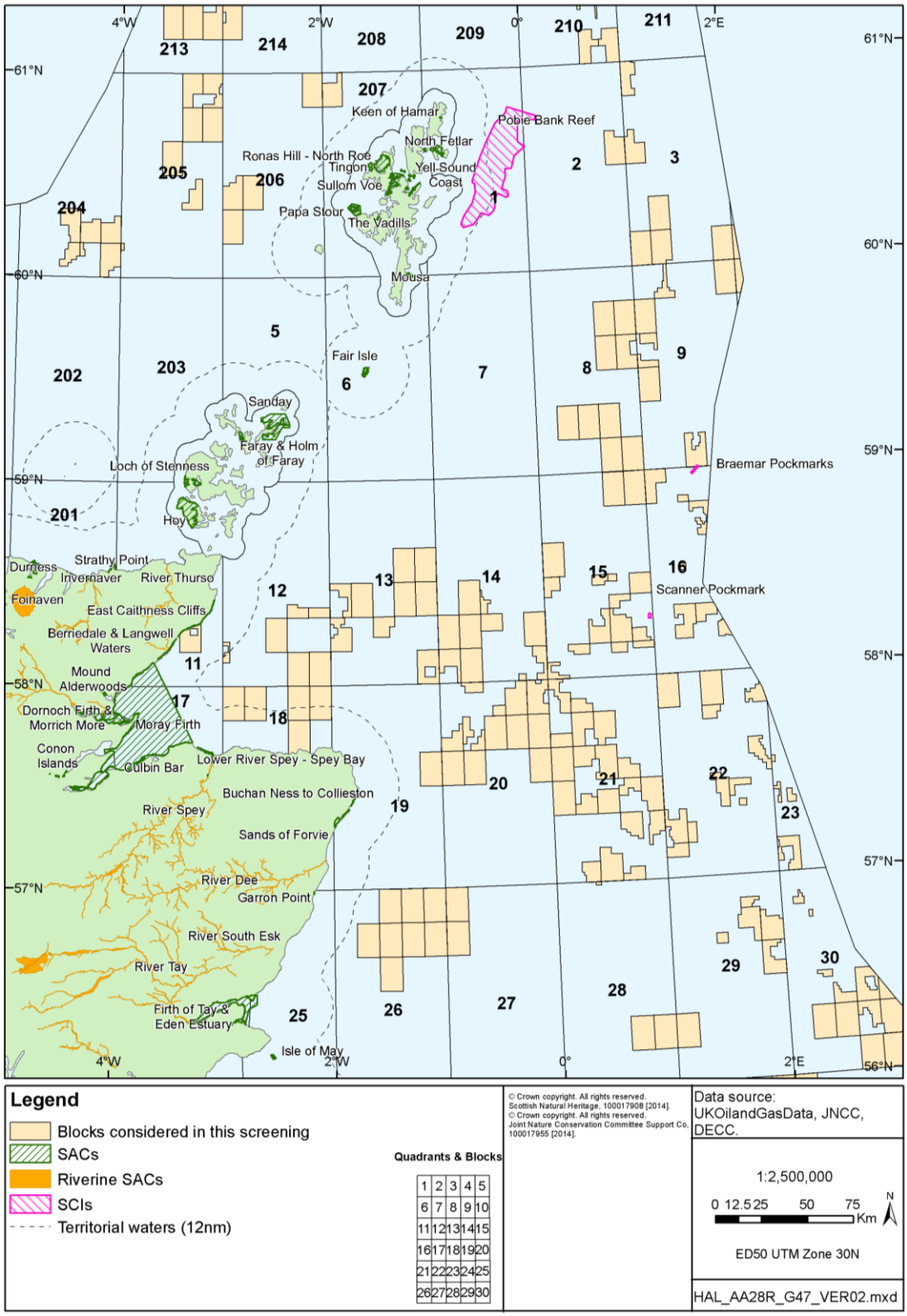
Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory Species	Article 4.2 Assemblages[41]
Otterswick and Graveland SPA	2241.41	Breeding: Red-throated diver	N/A	N/A
Orkney Mainland Moors SPA	5342.19	Breeding: Hen harrier Red-throated diver Short-eared owl Over winter: Hen harrier	N/A	N/A
Caithness and Sutherland Peatlands SPA	145516.75	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
Mointeach Scadabhaigh SPA	4148.44	Breeding: Black-throated diver Red-throated diver	N/A	N/A
Lewis Peatlands SPA	58984.23	Breeding: Black-throated diver Golden eagle Golden plover Merlin Red-throated diver	Breeding: Dunlin Greenshank	

[41]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.

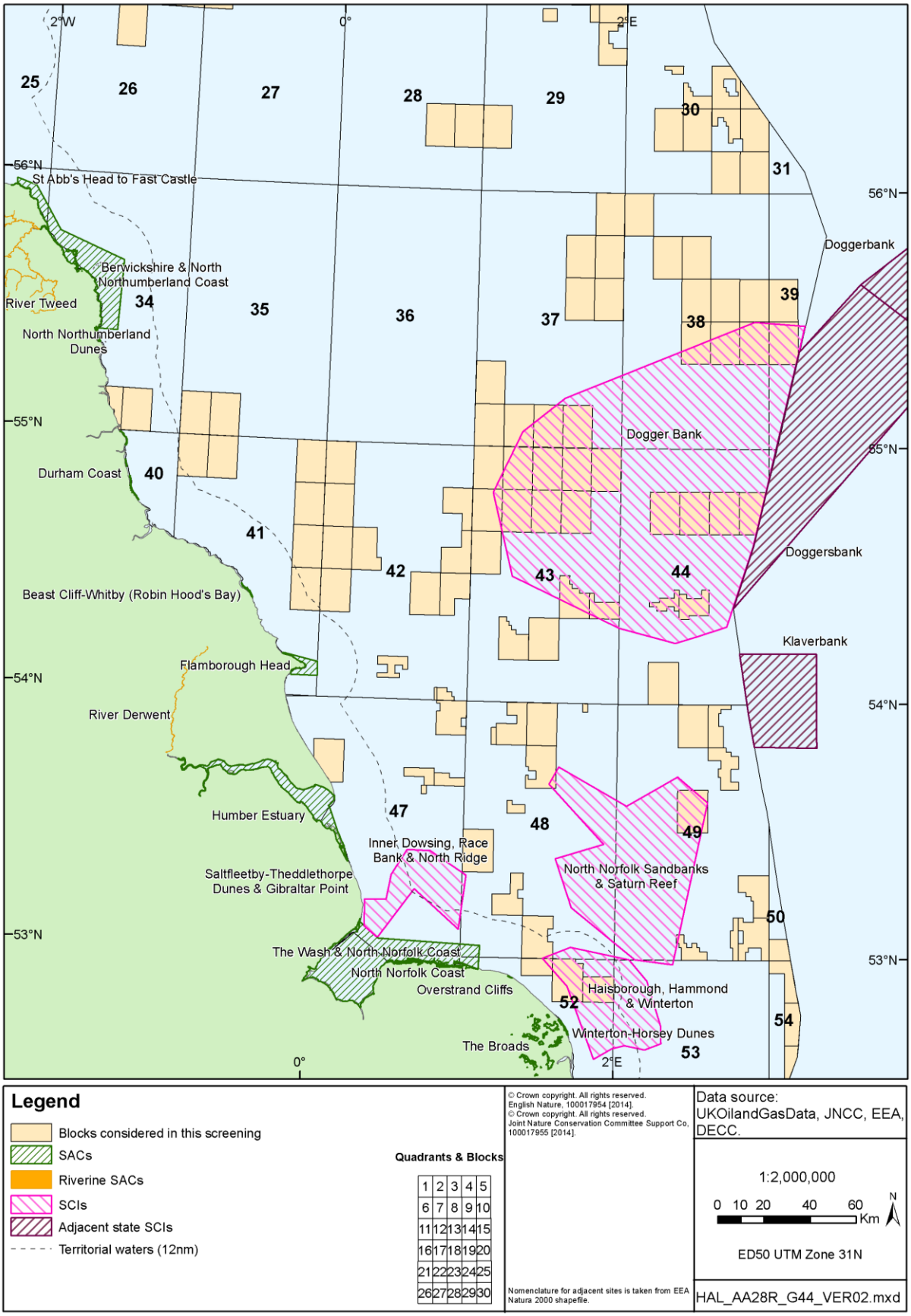
A4 Coastal and Marine Special Areas of Conservation

This section includes coastal or nearshore marine (within 12nm boundary) Special Areas of Conservation (SAC) sites which contain one or more of the Annex I coastal habitats listed in Box A.2 (below) or examples of 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 A5. Riverine/freshwater SACs which are designated for migratory fish and/or freshwater pearl mussel are listed in Section A6.

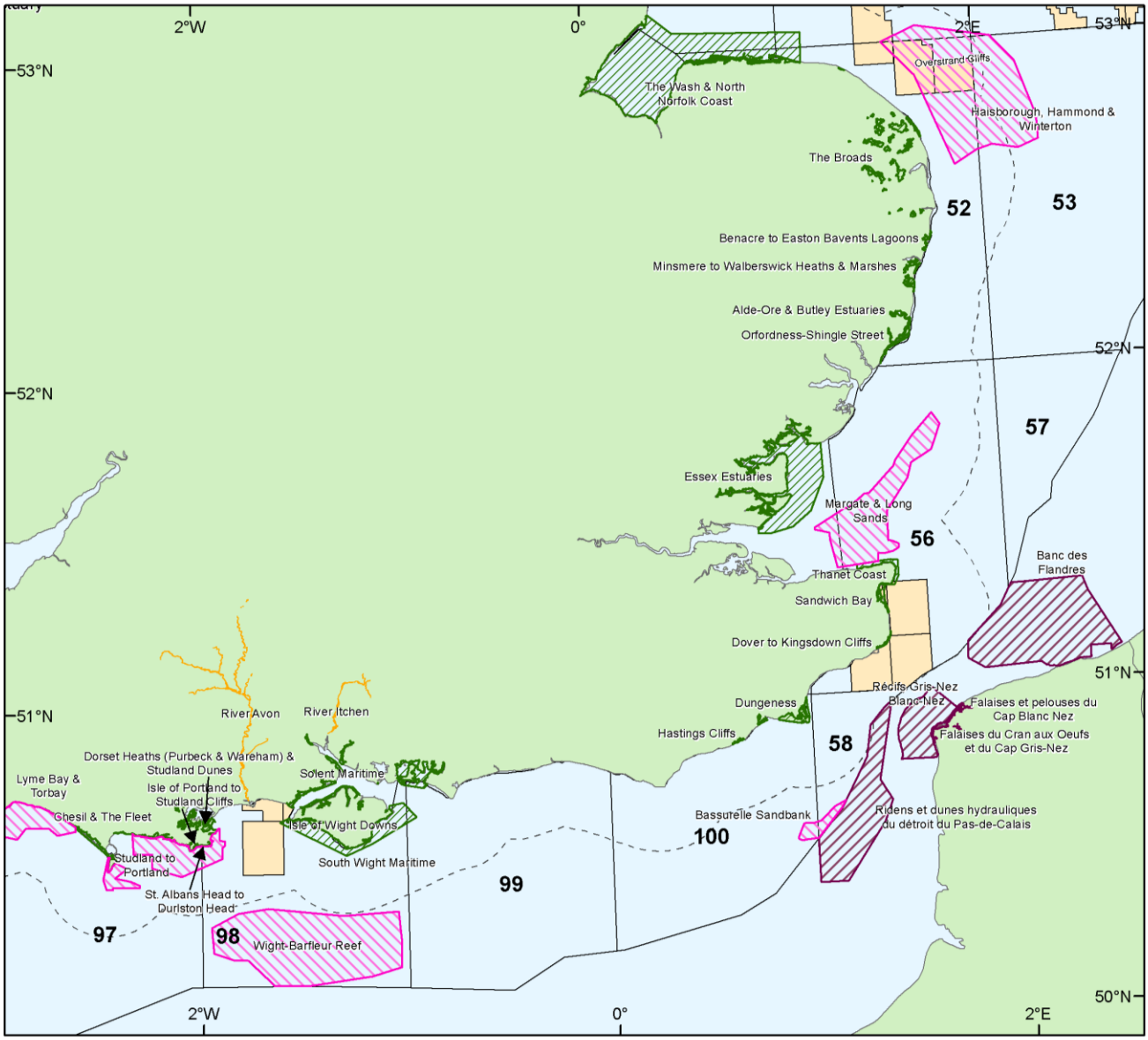
Map A.7: Location of SACs – Shetland to the Forth



Map A.8: Location of SACs – Berwickshire to Norfolk



Map A.9: Location of SACs – Norfolk to Dorset



Legend

- Blocks considered in this screening
- SACs
- Riverine SACs
- SCIs
- Adjacent state SCIs
- 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

Nomenclature for adjacent sites is taken from EEA Natura 2000 shapefile.

Data source: UKOilandGasData, JNCC, EEA, DECC.

1:2,000,000

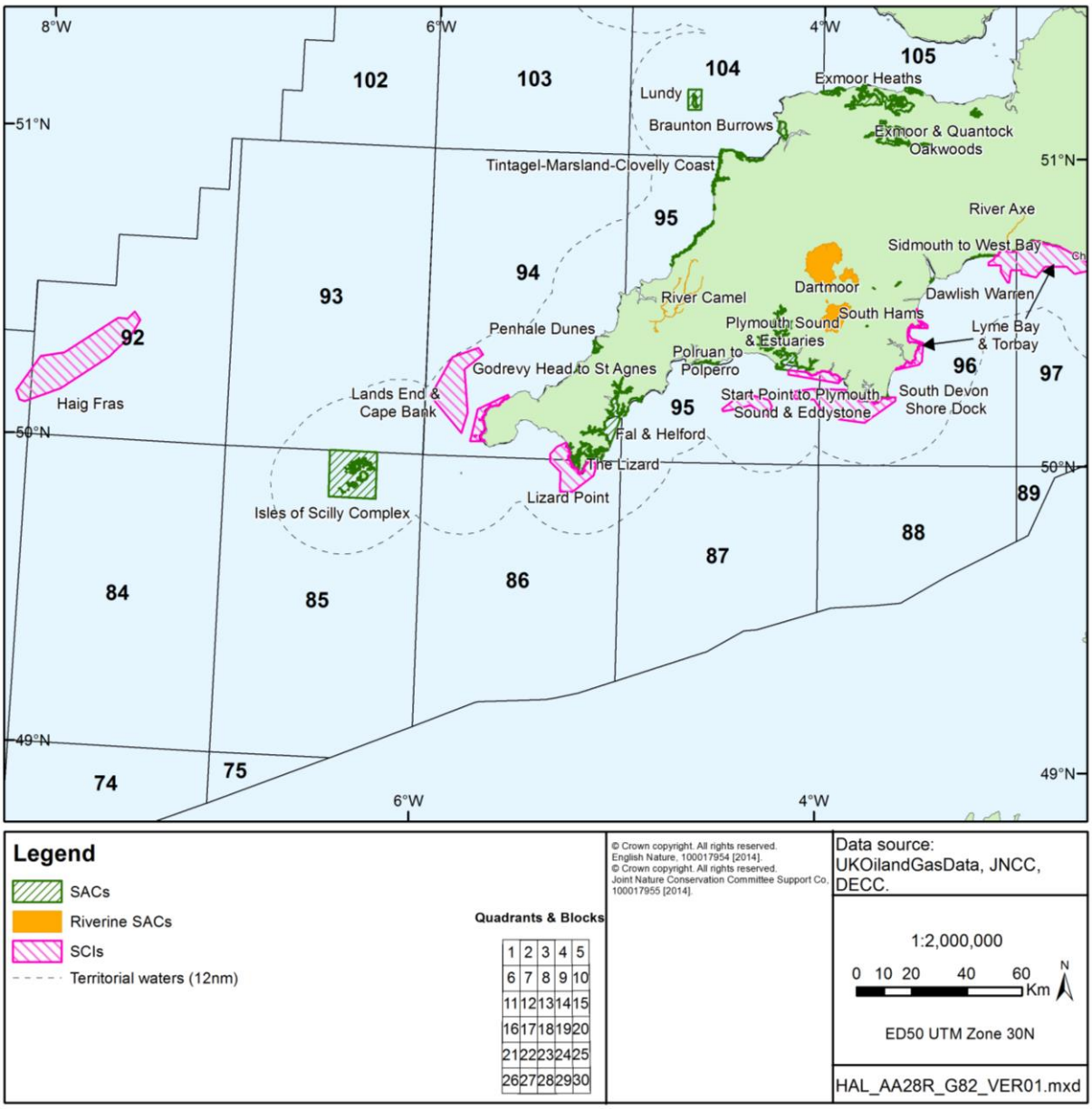
0 10 20 40 60 Km

N

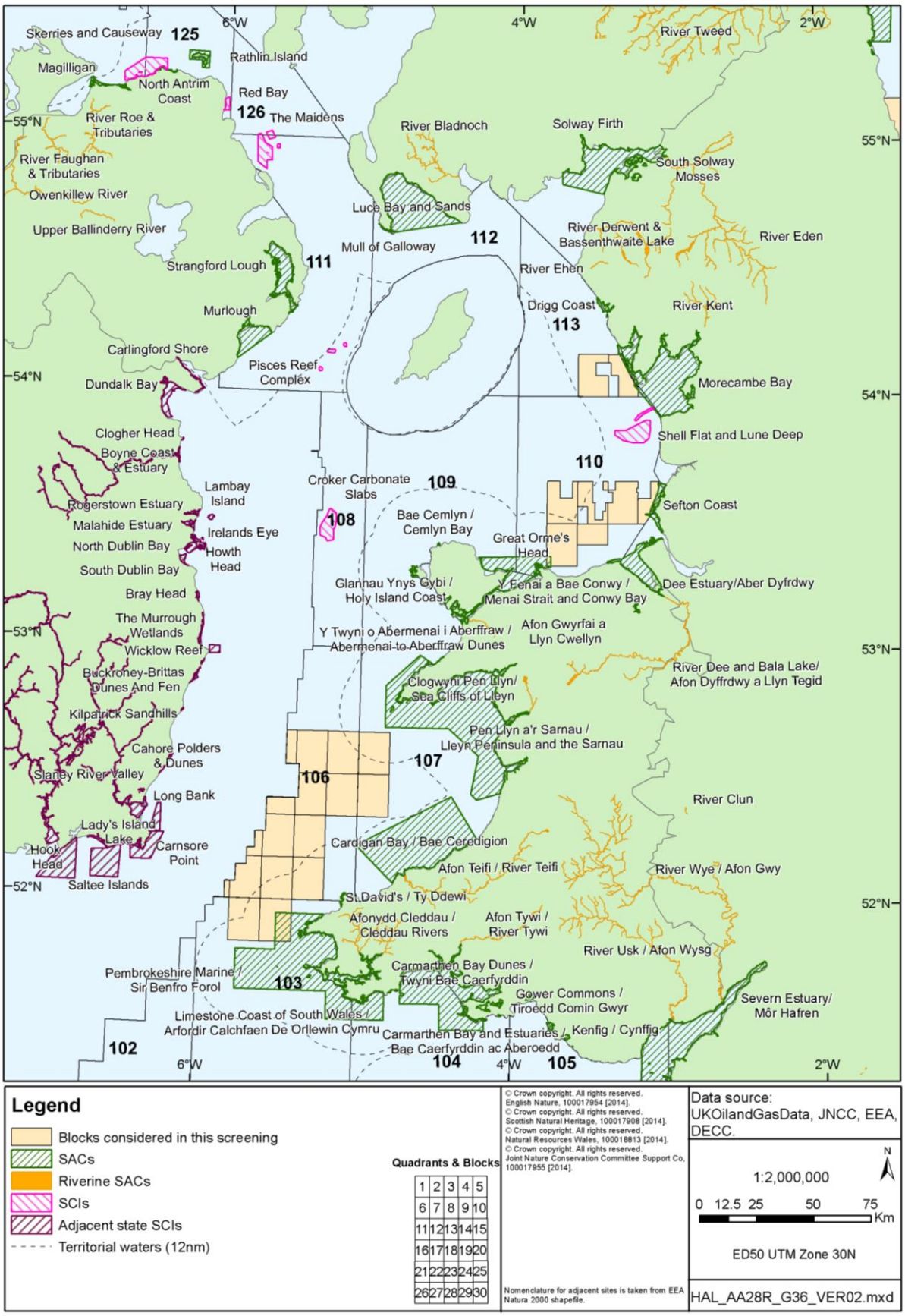
ED50 UTM Zone 30N

HAL_AA28R_G43_VER02.mxd

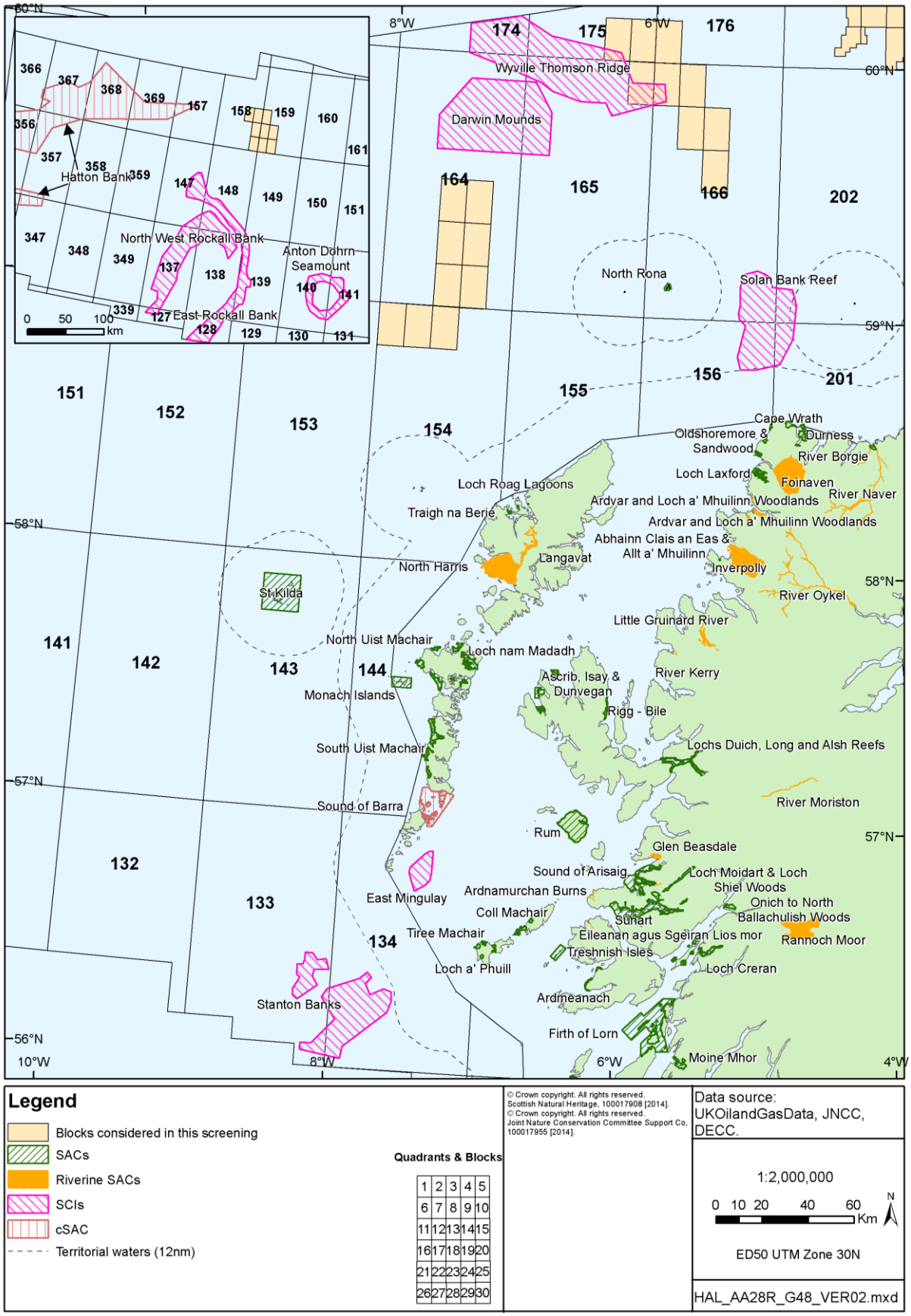
Map A.10: Location of SACs – Lyme Bay to the Severn



Map A.11: Location of SACs – Severn to Mull of Kintyre



Map A.12: Location of SACs – Scottish west coast and Islands



Box A.2: Annex 1 Habitat abbreviations used in site summaries

Annex I Habitat (abbreviated)	Annex I Habitat(s) (full description)
Bogs	Active raised bogs * Priority feature
	Blanket bogs * Priority feature
	Bog Woodland * Priority feature
	Degraded raised bogs still capable of natural regeneration
	Depressions on peat substrates of the *Rhynchosporion*
	Transition mires and quaking bogs
Caves	Caves not open to the public
Coastal Dunes	Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)
	Coastal dunes with *Juniperus* spp.
	Decalcified fixed dunes with *Empetrum nigrum*
	Dunes with Hippophae rhamnoides
	Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*)
	Embryonic shifting dunes
	Fixed dunes with herbaceous vegetation (`grey dunes`) * Priority feature
	Humid dune slacks
	Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`)
Coastal Lagoons	Coastal lagoons *Priority feature
Estuaries	Estauries
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	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) * Priority feature
	Old sessile oak woods with *Quercus robur* on sandy plains
	Tilio-Acerion forests of slopes, screes and ravines * Priority feature
	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) * Priority feature
Grasslands	Alpine and subalpine calcareous grasslands
	Calaminarian grasslands of the *Violetalia calaminariae*
	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
	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
	Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe) * Priority feature
Heaths	Alpine and Boreal heaths
	Dry Atlantic coastal heaths with *Erica vagans*
	European dry heaths
	Northern Atlantic wet heaths with *Erica tetralix*
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

Annex I Habitat (abbreviated)	Annex I Habitat(s) (full description)
Running freshwater	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
Salt marshes and salt meadows	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) *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	Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*) Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)
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	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. Mediterranean temporary ponds Natural dystrophic lakes and ponds Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*
Vegetation of drift lines	Annual vegetation of drift lines
Vegetation of stony banks	Perennial vegetation of stony banks

Table A.5: SACs from Shetland to Essex and their Qualifying Features

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
SHETLAND					
The Vadills SAC	62.43	Coastal lagoons	N/A	N/A	N/A
Papa Stour SAC	2076.69	Reefs Sea caves	N/A	N/A	N/A
Tingon SAC	569.3	Bogs	Standing freshwater	N/A	N/A
Ronas Hill-North Roe SAC	4900.9	Standing freshwater Heath Bogs	Heath Scree	N/A	N/A
Sullom Voe SAC	2698.55	Inlets and bays	Coastal lagoons Reefs	N/A	N/A
Yell Sound Coast SAC	1540.55	N/A	N/A	Otter *Lutra lutra* Harbour seal *Phoca vitulina*	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Keen of Hamar SAC	39.9	Grasslands Scree	Heath	N/A	N/A
North Fetlar SAC	1581.93	Heath Fens	N/A	N/A	N/A
Mousa SAC	530.6	N/A	Reefs Sea caves	Harbour seal *Phoca vitulina*	N/A
Fair Isle SAC	561.27	Sea cliffs	Heaths	N/A	N/A
Hascosay SAC	164.92	Bogs	N/A	N/A	Otter
ORKNEY					
Hoy SAC	9499.7	Sea cliffs Standing freshwater Heath Bog	Heath Fens Rocky slopes	N/A	N/A
Loch of Stenness SAC	791.87	Coastal lagoons	N/A	N/A	N/A
Stromness Heaths and Coasts SAC	635.78	Sea cliffs Heath	Fens	N/A	N/A
Faray and Holm of Faray SAC	785.68	N/A	N/A	Grey seal *Halichoerus grypus*	N/A
Sanday SAC	10971.65	Reefs	Sandbanks Mudflats and sandflats	Harbour seal *Phoca vitulina*	N/A
NORTH COAST OF SCOTLAND					
Strathy Point SAC	203.58	Sea cliffs	N/A	N/A	N/A
Invernaver SAC	294.54	Coastal dunes Heath Grasslands	Coastal dunes Fens	N/A	N/A
Durness SAC	1212.74	Coastal dunes Standing freshwater Grasslands Limestone pavements	Coastal dunes Heath Grasslands Fens	N/A	Otter *Lutra lutra*
Cape Wrath SAC	1015.21	Sea cliffs	N/A	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
MORAY FIRTH AND ABERDEENSHIRE					
East Caithness Cliffs SAC	442.64	Sea cliffs	N/A	N/A	N/A
Mound Alderwoods SAC	297.33	Forests	N/A	N/A	N/A
Moray Firth SAC	151347.17	N/A	Sandbanks	Bottlenose dolphin *Tursiops truncatus*	N/A
Conon Islands SAC	120.11	Forests	N/A	N/A	N/A
Dornoch Firth and Morrich More SAC	8700.53	Estuaries Mudflats and sandflats Saltmarsh and salt meadows Salt meadows Coastal dunes	Sandbanks Reefs	Otter *Lutra lutra* Harbour seal *Phoca vitulina*	N/A
Culbin Bar SAC	612.88	Vegetation of stony banks	Salt meadows Coastal dunes	N/A	N/A
Lower River Spey - Spey Bay SAC	652.6	Vegetation of stony banks Forests	N/A	N/A	N/A
Buchan Ness to Collieston SAC	207.52	Sea cliffs	N/A	N/A	N/A
Sands of Forvie SAC	734.05	Coastal dunes	N/A	N/A	N/A
SOUTH OF ABERDEENSHIRE					
Garron Point SAC	15.58	N/A	N/A	Narrow-mouthed whorl snail *Vertigo angustior*	N/A
Barry Links SAC	789.67	Coastal dunes	N/A	N/A	N/A
Firth of Tay and Eden Estuary SAC	15412.53	Estuaries	Sandbanks Mudflats and sandflats	Harbour seal *Phoca vitulina*	N/A
Isle of May SAC	356.75	N/A	Reefs	Grey seal *Halichoerus grypus*	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Berwickshire and North Northumberland Coast SAC	65045.5	Mudflats and sandflats Inlets and Bays Reefs Sea caves	N/A	Grey seal *Halichoerus grypus*	N/A
St Abb's Head to Fast Castle SAC	127.52	Sea cliffs	N/A	N/A	N/A
Tweed Estuary SAC	155.93	Estuaries Mudflats and sandflats	N/A	N/A	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*
NORTHEAST ENGLAND					
North Northumberland Dunes SAC	1147.56	Coastal dunes	N/A	Petalwort *Petalophyllum ralfsii*	N/A
Durham Coast SAC	393.63	Sea cliffs	N/A	N/A	N/A
YORKSHIRE AND THE HUMBER					
Beast Cliff-Whitby (Robin Hood's Bay) SAC	260.2	Sea cliffs	N/A	N/A	N/A
Flamborough Head SAC	6311.96	Reefs Sea cliffs Sea caves	N/A	N/A	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*
LINCOLNSHIRE, NORFOLK AND SUFFOLK					
Saltfleetby - Theddlethorpe Dunes and Gibraltar Point SAC	960.2	Coastal dunes	Coastal dunes	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
The Wash and North Norfolk Coast SAC	107761.28	Sandbanks Mudflats and sandflats Inlets and bays Reefs Salt marshes and salt meadows	Coastal lagoons	Harbour seal *Phoca vitulina*	Otter *Lutra lutra*
North Norfolk Coast SAC	3207.37	Coastal lagoons Vegetation of stony banks Salt marshes and salt meadows Coastal dunes	N/A	N/A	Otter *Lutra lutra* Petalwort *Petalophyllum ralfsii*
Overstrand Cliffs SAC	30.02	Sea cliffs	N/A	N/A	N/A
The Broads SAC	5889.66	Standing freshwater Bog Fens Forests	Grasslands	Desmoulin`s whorl snail *Vertigo moulinsiana* Fen orchid *Liparis loeselii* Ramshorn snail *Anisus vorticulus*	Otter *Lutra lutra*
Winterton-Horsey Dunes SAC	425.94	Coastal dunes	Coastal dunes	N/A	N/A
Benacre to Easton Bavents Lagoons SAC	366.93	Coastal lagoons	N/A	N/A	N/A
Minsmere to Walberswick Heaths and Marshes SAC	1265.52	Vegetation of drift lines Heath	Vegetation of stony banks	N/A	N/A
Alde, Ore and Butley Estuaries SAC	1561.53	Estuaries	Mudflats and sandflats Salt marshes and salt meadows	N/A	N/A
Orfordness-Shingle Street SAC	901.19	Coastal lagoons Vegetation of drift lines Vegetation of stony banks	N/A	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
ESSEX AND KENT					
Essex Estuaries SAC	46140.82	Estuaries Mudflats and sandflats Salt marshes and salt meadows	Sandbanks	N/A	N/A
Thanet Coast SAC	2803.84	Reefs Sea caves	N/A	N/A	N/A
Dover to Kingsdown Cliffs SAC	183.85	Sea cliffs	Grasslands	N/A	N/A
Sandwich Bay SAC	1137.87	Coastal dunes	Coastal dunes	N/A	N/A
Hastings Cliffs SAC	183.72	Sea cliffs	N/A	N/A	N/A
Dungeness SAC	3223.56	Vegetation of drift lines Vegetation of stony banks	N/A	Great crested newt *Triturus cristatus*	N/A
Margate and Long Sands SCI	64914	Sandbanks	N/A	N/A	N/A

Table A.6: SACs from Sutherland to Severn Estuary and their Qualifying Habitats

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
WEST SCOTLAND					
Inverpolly SAC	11877.32	Standing freshwater Heath Bogs	Heath Grassland Scree Rocky slopes Forest	Otter *Lutra lutra*	Freshwater pearl mussel *Margaritifera margaritifera*
North Rona SAC	628.53	N/A	Reefs Sea cliffs Sea caves	Grey seal *Halichoerus grypus*	N/A
Oldshoremore and Sandwood SAC	443.73	Coastal dunes Machairs	Coastal dunes	N/A	N/A
Loch Laxford SAC	1221.33	Inlets and bays	Reefs	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Ardvar and Loch a' Mhuilinn Woodlands SAC	805.99	Forest	N/A	N/A	Freshwater pearl mussel *Margaritifera margaritifera* Otter *Lutra lutra*
Achnahaird SAC	21.37	N/A	N/A	Petalwort *Petalophyllum ralfsii*	N/A
Loch Roag Lagoons SAC	43.62	Coastal lagoons	N/A	N/A	N/A
Tràigh na Berie SAC	153.75	Machairs	N/A	N/A	N/A
St Kilda SAC	25467.58	Reefs Sea cliffs Sea caves	N/A	N/A	N/A
North Uist Machair SAC	3048.54	Salt meadows Machairs Standing freshwater	Vegetation of drift lines Coastal dunes	N/A	Slender naiad *Najas flexilis*
Loch nam Madadh SAC	2320.38	Coastal lagoons Inlets and bays	Sandbanks Mudflats and sandflats Reefs	Otter *Lutra lutra*	N/A
Obain Loch Euphoirt SAC	348.59	Coastal lagoons	N/A	N/A	N/A
Monach Islands SAC	3646.58	Machairs	Coastal dunes	Grey seal *Halichoerus grypus*	N/A
South Uist Machair SAC	3432.65	Machairs Standing freshwater	Coastal lagoons Vegetation of drift lines Coastal dunes	Slender naiad *Najas flexilis*	Otter *Lutra lutra*
Sound of Barra cSAC	12507.46	Reefs Sandbanks	N/A	N/A	Harbour seal *Phoca vitulina*
East Mingulay SCI	11511	Reefs	N/A	N/A	N/A
Ascrib, Isay and Dunvegan SAC	2584.99	N/A	N/A	Harbour seal *Phoca vitulina*	N/A
Rigg - Bile SAC	500.89	Sea cliffs	Forest	N/A	N/A
Lochs Duich, Long and Alsh Reefs SAC	2380.86	Reefs	N/A	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Rum SAC	10835.33	Standing freshwater Heaths Grasslands Scree	Sea cliffs Heaths Grasslands Bogs Fens Scree Rocky slopes	Otter *Lutra lutra*	N/A
Glen Beasdale SAC	507.32	Forest	N/A	N/A	Freshwater pearl mussel *Margaritifera margaritifera* Otter *Lutra lutra*
Sound of Arisaig (Loch Ailort to Loch Ceann Traigh) SAC	4556.65	Sandbanks	N/A	N/A	N/A
Sunart SAC	10246.72	Forest	Reefs Heath Forest	Otter *Lutra lutra*	N/A
Coll Machair SAC	851.33	Coastal dunes Machairs	Coastal dunes Standing freshwater	Slender naiad *Najas flexilis*	N/A
Tiree Machair SAC	785.46	Coastal dunes Machairs Standing freshwater	Coastal dunes	N/A	N/A
Loch a' Phuill SAC	151.17	Standing freshwater	N/A	N/A	N/A
Treshnish Isles SAC	1962.66	N/A	Reefs	Grey seal *Halichoerus grypus*	N/A
Eileanan agus Sgeiran Lios mór SAC	1139.62	N/A	N/A	Harbour seal *Phoca vitulina*	N/A
Loch Creran SAC	1226.39	Reefs	N/A	N/A	N/A
Ardmeanach SAC	374.79	Grassland	Sea cliffs	N/A	N/A
Loch Moidart and Loch Shiel Woods SAC	1756.77	Forests	Mudflats and sandflats Forests	N/A	Otter *Lutra lutra*

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Mull Oakwoods SAC	1401.89	Forests	N/A	N/A	Otter *Lutra lutra*
Firth of Lorn, Marine SAC	20975.01	Reefs	N/A	N/A	N/A
Oronsay SAC	340.07	Machairs	N/A	N/A	N/A
Moine Mhor SAC	1150.41	Bogs	Mudflats and sandflats Salt marshes and salt meadows Forests	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia* Otter *Lutra lutra*
Glac na Criche SAC	265.33	Bogs	Sea cliffs Heaths	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*
Rinns of Islay SAC	1149.7	N/A	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*	N/A
South-East Islay Skerries SAC	1498.3	N/A	N/A	Harbour seal *Phoca vitulina*	N/A
Tayvallich Juniper and Coast SAC	1213.47	Scrub (matorral)	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*	Otter *Lutra lutra*
Tarbert Woods SAC	1595.97	Forests	N/A	N/A	N/A
NORTH NORTHERN IRELAND					
Magilligan SAC	1058.22	Coastal dunes	Coastal dunes	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia* Petalwort *Petalophyllum ralfsii*
Bann Estuary SAC	347.94	Coastal dunes	Salt marshes and salt meadows Coastal dunes	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Rathlin Island SAC	3344.62	Reefs Sea cliffs Sea caves	Sandbanks Vegetation of drift lines	N/A	N/A
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
Red Bay SCI	965.54	Sandbanks	N/A	N/A	N/A
The Maidens SCI	7461.36	Reefs Sandbanks	N/A	N/A	Grey seal *Halichoerus grypus*
Skerries and Causeway SCI	10862	Reefs Sandbanks Sea caves	N/A	N/A	Harbour porpoise *Phocoena phocoena*
EAST NORTHERN IRELAND					
Strangford Lough SAC	15398.54	Mudflats and sandflats Coastal lagoons Inlets and bays Reefs	Vegetation of drift lines Vegetation of stony banks Salt marshes and salt meadows	N/A	Harbour seal *Phoca vitulina*
Murlough SAC	11902.03	Coastal dunes	Sandbanks Mudflats and sandflats Salt marshes and salt meadows Coastal dunes	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*	Harbour seal *Phoca vitulina*
SOUTHWEST SCOTLAND					
Mull of Galloway SAC	136.39	Sea cliffs	N/A	N/A	N/A
Luce Bay and Sands SAC	48759.28	Inlets and bays Coastal dunes	Sandbanks Mudflats and sandflats Reefs	N/A	Great crested newt *Triturus cristatus*

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Solway Firth SAC	43636.72	Sandbanks Estuaries Mudflats and sandflats Salt marshes and salt meadows	Reefs Vegetation of stony banks Coastal dunes	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*	N/A
NORTHWEST ENGLAND					
Drigg Coast SAC	1397.44	Estuaries Coastal dunes	Mudflats and sandflats Salt marshes and salt meadows Coastal dunes	N/A	N/A
Morecambe Bay SAC	61506.22	Estuaries Mudflats and sandflats Inlets and bays Vegetation of stony banks Salt marshes and salt meadows Coastal dunes	Sandbanks Coastal lagoons Reefs Coastal dunes	Great crested newt *Triturus cristatus*	N/A
Sefton Coast SAC	4563.97	Coastal dunes	Coastal dunes	Petalwort *Petalophyllum ralfsii*	Great crested newt *Triturus cristatus*
Dee Estuary SAC	15805.89	Mudflats and sandflats Salt marshes and salt meadows	Estuaries Sea cliffs Vegetation of drift lines Coastal dunes	N/A	River lamprey *Lampetra fluviatilis* Sea lamprey *Petromyzon marinus* Petalwort *Petalophyllum ralfsii*

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
River Dee and Bala Lake SAC	1308.93	Running freshwater	N/A	Atlantic salmon *Salmo salar* Floating water-plantain *Luronium natans*	Sea lamprey *Petromyzon marinus* Brook lamprey *Lampetra planeri* River lamprey *Lampetra fluviatilis* Bullhead *Cottus gobio* Otter *Lutra lutra*
Shell Flat and Lune Deep SCI	10565	Sandbanks Reefs	N/A	N/A	N/A
NORTH AND WEST WALES					
Great Orme's Head / Pen y Gogarth SAC	302.63	Heaths Grasslands	Sea cliffs	N/A	N/A
Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC	26482.67	Sandbanks Mudflats and sandflats Reefs	Inlets and bays Sea caves	N/A	N/A
Bae Cemlyn/Cemlyn Bay SAC	43.43	Coastal lagoons	Vegetation of stony banks	N/A	N/A
Glannau Ynys Gybi/Holy Island Coast SAC	464.27	Sea cliffs Heaths	Heaths	N/A	N/A
Glannau Môn: Cors heli/Anglesey Coast: Saltmarsh SAC	1058	Salt marshes and salt meadows	Estuaries Mudflats and sandflats	N/A	N/A
Glan-traeth SAC	14.1	N/A	N/A	Great crested newt *Triturus cristatus*	N/A
Y Twyni o Abermenai i Aberffraw/Abermenai to Aberffraw Dunes SAC	1871.03	Coastal dunes	Standing freshwater	Petalwort *Petalophyllum ralfsii* Shore dock *Rumex rupestris*	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Clogwyni Pen Llyn/Seacliffs of Lleyn SAC	1048.4	Sea cliffs	N/A	N/A	N/A
Pen Llyn a`r Sarnau/Lleyn Peninsula and the Sarnau SAC	146023.48	Sandbanks Estuaries Coastal lagoons Inlets and bays Reefs	Mudflats and sandflats Salt marshes and salt meadows Sea caves	N/A	Bottlenose dolphin *Tursiops truncatus* Otter *Lutra lutra* Grey Seal *Halichoerus grypus*
Morfa Harlech a Morfa Dyffryn SAC	1062.57	Coastal dunes	N/A	Petalwort *Petalphyllum ralfsii*	N/A
Cardigan Bay/Bae Ceredigion SAC	95860.36	N/A	Sandbanks Reefs Sea caves	Bottlenose dolphin *Tursiops truncatus*	Sea lamprey *Petromyson marinus* River lamprey *Lampetra fluviatilis* Grey seal *Halichoerus grypus*
SOUTH WALES					
Limestone Coast of South West Wales/Arfordir Calchfaen de Orllewin Cymru SAC	1594.53	Sea cliffs Dunes	Heaths Grasslands Sea caves Caves	Greater horseshoe bat *Rhinolophus ferrumequinum* Early gentian *Gentianella anglica*	Petalwort *Petalophyllum ralfsii*
Pembrokeshire Marine/Sir Benfro Forol SAC	138069.45	Estuaries Inlets and bays Reefs	Sandbanks Mudflats and sandflats Coastal lagoons Salt marshes and salt meadows Sea caves	Grey seal *Halichoerus grypus* Shore dock *Rumex rupestris*	Sea lamprey *Petromyson marinus* River lamprey *Lampetra fluviatilis* Otter *Lutra lutra* Allis shad *Alosa alosa* Twaite shad *Alosa fallax*

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston SAC	122.44	Standing freshwater	N/A	Greater horseshoe bat *Rhinolophus ferrumequinum*	Lesser horseshoe bat *Rhinolophus hipposideros* Otter *Lutra lutra*
St David's/Ty Ddewi SAC	935.47	Sea cliffs Heaths	N/A	Floating water-plantain *Luronium natans*	N/A
Carmarthen Bay and Estuaries/Bae Caerfyrddin ac Aberoedd SAC	66101.16	Sandbanks Estuaries Mudflats and sandflats Inlets and bays Salt marshes and salt meadows	N/A	Twaite shad *Alosa fallax*	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis* Allis shad *Alosa alosa* Otter *Lutra lutra*
Carmarthen Bay Dunes / Twyni Bae Caerfyrddin SAC	1206.32	Coastal dunes	N/A	Narrow-mouthed whorl snail *Vertigo angustior* Petalwort *Petalophyllum ralfsii* Fen orchid *Liparis loeselii*	N/A
Gower Commons/Tiroedd Comin Gwyr SAC	1776.72	Heaths Grasslands	N/A	Southern damselfly *Coenagrion mercuriale* Marsh fritillary butterfly *Euphydryas aurinia*	N/A
Crymlyn Bog / Cors Crymlyn SAC	299.45	Bogs Fens	Forest	N/A	N/A
Kenfig/Cynffig SAC	1191.67	Coastal dunes Standing freshwater	Salt marshes and salt meadows	Petalwort *Petalophyllum ralfsii* Fen orchid *Liparis loeselii*	N/A
Dunraven Bay SAC	6.47	N/A	N/A	Shore dock *Rumex rupestris*	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Severn Estuary/Môr Hafren SAC	73715.4	Estuaries Mudflats and sandflats Salt marshes and salt meadows	Sandbanks Reefs	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis* Twaite shad *Alosa fallax*	N/A

Table A.7: SACs from North Devon coast to Kent and their Qualifying Features

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
CORNWALL AND DEVON					
Exmoor Heaths SAC	10705.87	Heaths	Sea cliffs Bogs Fens Forest	N/A	N/A
Exmoor and Quantock Oakwoods SAC	1895.17	Forest	Forest	Barbastelle bat *Barbastella barbastellus*	Bechstein's bat *Myotis bechsteinii* Otter *Lutra lutra*
Braunton Burrows SAC	1346.64	Coastal dunes	Mudflats and sandflats	Petalwort *Petallophylum ralfsii*	N/A
Lundy SAC	3064.53	Reefs	Sandbanks Sea caves	N/A	Grey seal *Halichoerus grypus*
Tintagel–Marsland-Clovelly Coast SAC	2429.84	Sea cliffs Forest	Heaths	N/A	N/A
Penhale Dunes SAC	621.34	Coastal dunes	Coastal dunes	Petalwort *Petalophyllum ralfsii* Shore dock *Rumex rupestris* Early gentian *Gentianella anglica*	N/A
Godrevy Head to St Agnes SAC	128.07	Heaths	N/A	Early gentian *Gentianella anglica*	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Isles of Scilly Complex SAC	26850.95	Sandbanks Mudflats and sandflats Reefs	N/A	Shore dock *Rumex rupestris*	Grey seal *Halichoerus grypus*
The Lizard SAC	3257.11	Sea cliffs Standing freshwater Heaths	N/A	N/A	N/A
Fal and Helford SAC	6387.8	Sandbanks Mudflats and sandflats Inlets and bays Salt marshes and salt meadows	Estuaries Reefs	Shore dock *Rumex rupestris*	N/A
Polruan to Polperro SAC	213.39	Sea cliffs	Heaths	Shore dock *Rumex rupestris*	N/A
Plymouth Sound and Estuaries SAC	6402.03	Sandbanks Estuaries Inlets and bays Reefs Salt marshes and salt meadows	Mudflats and sandflats	Shore dock *Rumex rupestris*	Allis shad *Alosa alosa*
Blackstone Point SAC	7.38	N/A	N/A	Shore dock *Rumex rupestris*	N/A
South Devon Shore Dock SAC	341.01	Sea cliffs	N/A	Shore dock *Rumex rupestris*	N/A
South Hams SAC	129.53	Heath Grassland	Sea cliffs Caves Forest	Greater horseshoe bat *Rhinolophus ferrumiquinum*	N/A
Dawlish Warren SAC	58.84	Coastal dunes	Coastal dunes	Petalwort *Petalophyllum ralfsii*	N/A
Sidmouth to West Bay SAC	897.3	Sea cliffs Forest	Vegetation of drift lines	N/A	N/A
Lands End and Cape Bank SCI	30172	Reefs	N/A	N/A	N/A
Lizard Point SCI	13988	Reefs	N/A	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Start Point to Plymouth Sound & Eddystone SCI	34076.13	Reefs	N/A	N/A	N/A
Lyme Bay and Torbay SCI	31248	Reefs Sea Caves	N/A	N/A	N/A
SOUTH COAST					
Chesil and the Fleet SAC	1631.63	Coastal lagoons Vegetation of drift lines Vegetation of stony banks Salt marshes and salt meadows	Salt marshes and salt meadows	N/A	N/A
Isle of Portland to Studland Cliffs SAC	1447.5	Sea cliffs Grassland	Vegetation of drift lines	Early gentian *Gentianella anglica*	N/A
St Albans Head to Durlston Head SAC	287.22	Sea cliffs Grassland	N/A	Early gentian *Gentianella anglica*	Greater horseshoe bat *Rhinolophus ferrumiquinum*
Dorset Heaths (Purbeck and Wareham and Studland Dunes SAC	2221.94	Coastal dunes Standing freshwater Heath Bogs	Grassland Fens Forest	Southern damselfly *Coenagrion mercuriale*	Great crested newt *Triturus cristatus*
Solent and Isle of Wight Lagoons SAC	36.24	Coastal lagoons	N/A	N/A	N/A
South Wight Maritime SAC	19862.71	Reefs Sea cliffs Sea caves	N/A	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Solent Maritime SAC	11325.09	Estuaries Salt marshes and salt meadows	Sandbanks Mudflats and sandflats Coastal lagoons Vegetation of drift lines Vegetation of stony banks Salt marshes and salt meadows Coastal dunes	N/A	Desmoulin's whorl snail *Vertigo moulinisiana*
Isle of Wight Downs SAC	461.8	Sea cliffs Heaths Grassland	N/A	Early gentian *Gentianella anglica*	N/A
Studland to Portland SCI	33191.09	Reefs	N/A	N/A	N/A
Briddlesford Copses SAC	167.22	N/A	N/A	Bechstein's bat *Myotis bechsteinii*	N/A

A5 Offshore Special Areas of Conservation

Table A.8: Offshore SACs and their Qualifying Features

Site Name	Area (ha)	Annex 1 Habitat	Annex II Species
Dogger Bank SCI	1,233,115	Sandbanks	N/A
North Norfolk Sandbanks and Saturn Reef SCI	360,341	Sandbanks Reefs	N/A
Inner Dowsing, Race Bank and North Ridge SCI	84,514	Sandbanks Reefs (biogenic *Sabellaria spinulosa*)	N/A
Haisborough, Hammond and Winterton SCI	146,759	Sandbanks Reefs (biogenic *Sabellaria spinulosa*)	N/A
Darwin Mounds SCI	137,726	Reefs	N/A
Wyville Thomson Ridge SCI	173,995	Reefs	N/A
Scanner Pockmark SCI	335	Submarine structures made by leaking gases	N/A
Braemar Pockmarks SCI	518	Submarine structures made by leaking gases	N/A
Pobie Bank Reef SCI	96,575	Reefs	N/A
Solan Bank Reef SCI	85,593	Reefs	N/A

Site Name	Area (ha)	Annex 1 Habitat	Annex II Species
North West Rockall Bank SCI (beyond scope of maps)	436,526	Reefs (biogenic *Lophelia pertusa*)	N/A
Anton Dohrn Seamount SCI	142,861	Reefs	N/A
East Rockall Bank SCI (beyond scope of maps)	369,489	Reefs	N/A
Hatton Bank cSAC (beyond scope of maps)	1,569,433	Reefs	N/A
Stanton Banks SCI	81,727	Reefs	N/A
Croker Carbonate Slabs SCI	6,591	Submarine structures made by leaking gases	N/A
Pisces Reef Complex SCI	873	Reefs	N/A
Haig Fras SCI	48,103	Reefs	N/A
Bassurelle Sandbank SCI	6,709	Sandbanks	N/A
Wight-Barfleur Reef SCI	137,344	Reefs	N/A

A6 Riverine and Freshwater Special Areas of Conservation

Table A.9: 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]
Mingarry Burn	✓	-
Ardnamurchan Burns	✓	-
River Moidart	✓	-
Glen Beasdale	✓	-
Rannoch Moor	✓	-
River Moriston	✓	AS
River Kerry	✓	-
Little Gruinard River	-	AS
River Oykel	✓	AS
Inverpolly	✓	-
Abhainn Clais An Eas and Allt a`Mhuilinn	✓	-
Ardvar and Loch a'Mhuilinn Woodlands	✓	-
Foinaven	✓	-
River Borgie	✓	AS
North Harris	✓	AS
Langavat	-	AS
River Thurso	-	AS
River Naver	✓	AS
Berriedale and Langwell Waters	-	AS
River Evelix	✓	-
River Spey	✓	AS, SL
River Dee	✓	AS
River South Esk	✓	AS

Site Name	Freshwater pearl mussel *Margaritifera margaritifera*	Migratory fish[1]
River Tay	-	AS, RL, SL
River Teith	-	AS, RL, SL
Endrick Water	-	AS, RL
River Tweed	-	AS, RL, SL
River Derwent	-	SL, RL
River Itchen	-	AS
River Avon	-	AS, SL
River Axe	-	SL
Dartmoor	-	AS
River Camel	-	AS
River Wye / Afon Gwy	-	AS, SL, RL, TS, ASh
River Usk / Afon Wysg	-	AS, SL, RL, TS, ASh
Afon Tywi / River Tywi	-	SL, RL, TS, ASh
Afonydd Cleddau / Cleddau Rivers	-	SL, RL
Afon Teifi / River Teifi	-	AS, SL, RL
River Clun	✓	-
Afon Eden - Cors Goch Trawsfynydd	✓	AS
Afon Gwyrfai a Llyn Cwellyn	-	AS
River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid	-	AS, SL, RL
River Kent	✓	-
River Derwent & Bassenthwaite Lake	-	AS, SL, RL
River Ehen	✓	AS
River Eden	-	AS, SL, RL
River Bladnoch	-	AS
River Roe and Tributaries	-	AS
Upper Ballinderry River	✓	-
Cladagh (Swanlinbar) River	✓	-
Lough Melvin	-	AS
Owenkillew River	✓	AS
River Foyle and Tributaries	-	AS
River Faughan and Tributaries	-	AS

[1] *SL - Sea lamprey Petromyzon marinus, RL - River lamprey Lampetra fluviatilis, AS - Atlantic salmon Salmo salar, TS - Twaite shad Alosa fallax, ASh - Allis shad Alosa alosa*

A7 Sites in the adjacent waters of other member states

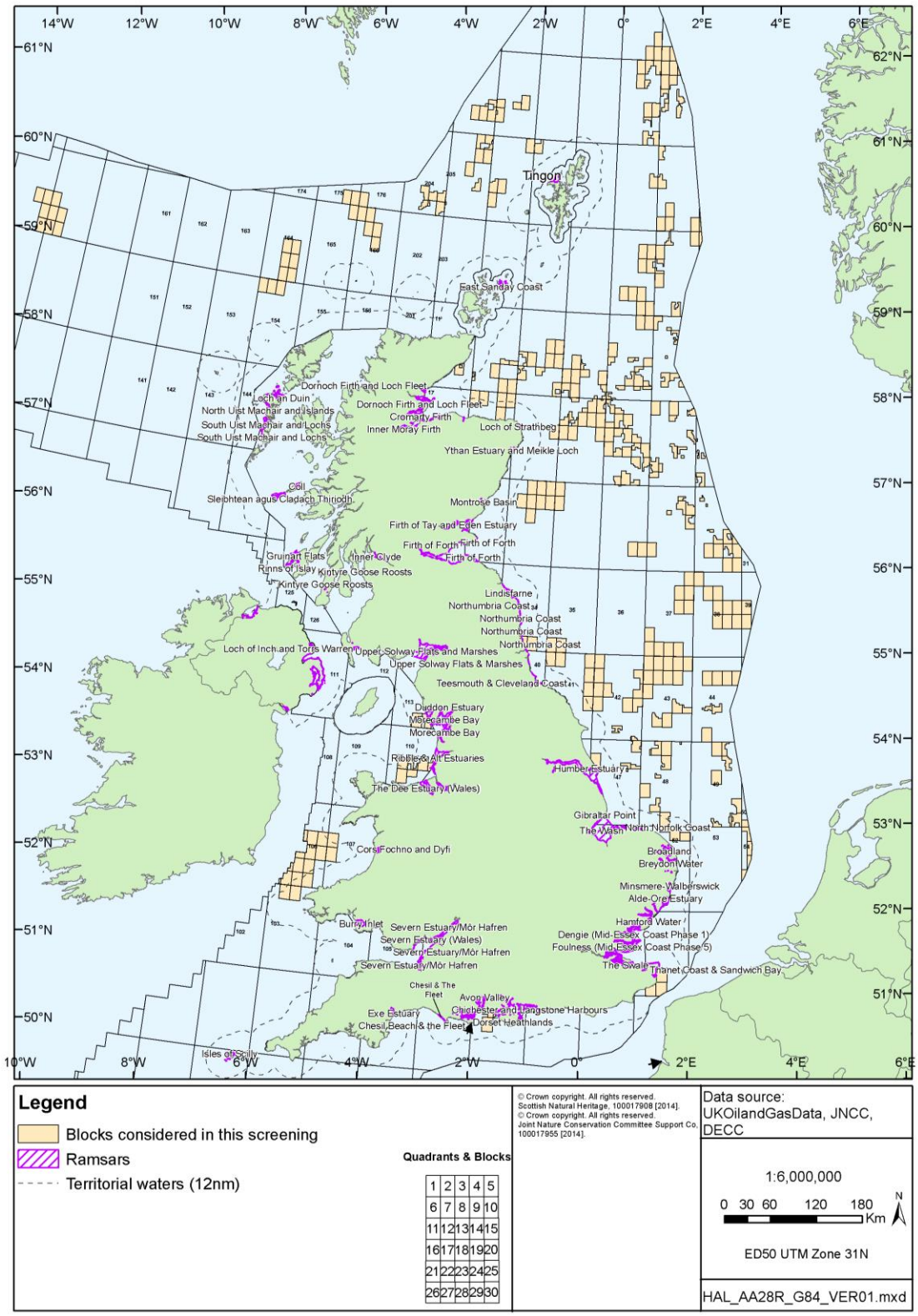
Offshore sites in adjacent states are listed in Table A.10 below. Coastal sites in France and the Republic of Ireland are shown in Maps A.3, A.5, A.9 and A.11, and were considered in this screening assessment.

Table A.10: Sites in the adjacent waters of other member states

Site Name	Area (ha)	Annex 1 Habitat	Annex II Species
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*
Banc des Flandres SCI (France)	112,919	Sandbanks	Harbour porpoise *Phocoena phocoena* Grey seal *Halichoerus grypus* Harbour seal *Phoca vitulina*
Recifs Gris-Nez Blanc-Nez – SCI (France)	29,156	Sandbanks, Reefs	Harbour porpoise *Phocoena phocoena* Grey seal *Halichoerus grypus* Harbour seal *Phoca vitulina*
Ridens et dunes hydrauliques du détroit du Pas-de-Calais SCI (France)	68,245	Sandbanks Reefs	Harbour porpoise *Phocoena phocoena* Grey seal *Halichoerus grypus* Harbour seal *Phoca vitulina*
Cap-Gris-Nez – SPA (France)	56,224	An extension of the area of existing SPA abuts the median line. The extension covers over 480 km^2 of surface in depths up to 69m. Migrating and wintering bird communities. Breeding fulmars, herring gulls, kittiwakes. Also breeding greater black-backed gull, lesser black backed gull, peregrine falcon.	

A8 Ramsar sites

Map A.13: Location of coastal Ramsar Sites



With the exception of Pevensey Levels[42], the coastal Ramsar sites 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 overleaf.

[42] The Pevensey Levels Ramsar site is mainly terrestrial but includes some shingle and intertidal mud and sand.

Table A.11: Coastal Ramsar sites and corresponding Natura 2000 sites

Ramsar Name	SPA Name	SAC Name
Alde–Ore Estuary	Alde–Ore Estuary	Alde, Ore and Butley Estuaries Orfordness – Shingle Street
Avon Valley	Avon Valley	River Avon
Belfast Lough	Belfast Lough Belfast Lough Open Water Outer Ards	
Benfleet and Southend Marshes	Benfleet and Southend Marshes Foulness (Mid-Essex Coast Phase 5)	Essex Estuaries
Blackwater Estuary (Mid-Essex Coast Phase 4)	Blackwater Estuary (Mid-Essex Coast Phase 4) Dengie (Mid-Essex Coast Phase 1)	Essex Estuaries
Breydon Water Bridgend Flats, Islay	Breydon Water Bridgend Flats, Islay	
Broadland	Broadland	The Broads
Burry Inlet	Bae Caerfyrddin/ Carmarthen Bay Burry Inlet	Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd Carmarthen Bay Dunes/ Twyni Bae Caerfyrddin
Caithness and Sutherland Peatlands	Caithness and Sutherland Peatlands	
Carlingford Lough	Carlingford Lough	
Chesil Beach and The Fleet	Chesil Beach and The Fleet	Chesil and the Fleet
Chichester and Langstone Harbours	Chichester and Langstone Harbours	Solent and Isle of Wight Lagoons Solent Maritime
Coll	Coll	
Colne Estuary (Mid-Essex Coast Phase 2)	Colne Estuary (Mid-Essex Coast Phase 2)	Essex Estuaries
Cors Fochno and Dyfi	Dyfi Estuary / Aber Dyfi	Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau
Cromarty Firth	Cromarty Firth	Conon Islands Moray Firth
Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)	Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Dengie (Mid-Essex Coast Phase 1)	Essex Estuaries
Crymlyn Bog		Crymlyn Bog/ Cors Crymlyn
Deben Estuary	Deben Estuary	
Dengie (Mid-Essex Coast Phase 1)	Blackwater Estuary (Mid-Essex Coast Phase 4) Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Dengie (Mid-Essex Coast Phase 1)	Essex Estuaries
Dornoch Firth and Loch Fleet	Dornoch Firth and Loch Fleet	Dornoch Firth and Morrich More Moray Firth Mound Alderwoods
Dorset Heathlands	Poole Harbour	Dorset Heaths (Purbeck and Wareham) and Studland Dunes
Duddon Estuary	Duddon Estuary Morecambe Bay	Morecambe Bay
East Sanday Coast	East Sanday Coast	Sanday

Ramsar Name	SPA Name	SAC Name
Eilean na Muice Duibhe (Duich Moss), Islay	Eilean na Muice Duibhe (Duich Moss), Islay	
Exe Estuary	Exe Estuary	Dawlish Warren
Firth of Forth	Firth of Forth	
Firth of Tay & Eden Estuary	Firth of Tay & Eden Estuary	Barry Links Firth of Tay & Eden Estuary
Foulness (Mid-Essex Coast Phase 5)	Benfleet and Southend Marshes Foulness (Mid-Essex Coast Phase 5)	Essex Estuaries
Gibraltar Point	Gibraltar Point The Wash	Saltfleetby–Theddlethorpe Dunes and Gibraltar Point The Wash and North Norfolk Coast
Gruinart Flats, Islay	Gruinart Flats, Islay Rinns of Islay	Rinns of Islay
Hamford Water	Hamford Water	
Humber Estuary	Humber Estuary	Humber Estuary Saltfleetby–Theddlethorpe Dunes and Gibraltar Point
Inner Clyde Estuary	Inner Clyde Estuary	
Inner Moray Firth	Inner Moray Firth	Moray Firth
Isles of Scilly	Isles of Scilly	Isles of Scilly Complex
Killough Bay	Killough Bay	
Kintyre Goose Roosts	Kintyre Goose Roosts	
Larne Lough	Larne Lough	
Lewis Peatlands	Lewis Peatlands	Langavat
Lindisfarne	Lindisfarne Northumbria Coast	Berwickshire and North Northumberland Coast North Northumberland Dunes
Loch an Duin		Loch nam Madadh
Loch Eye	Loch Eye	
Loch of Inch and Torrs Warren	Loch of Inch and Torrs Warren	Luce Bay and Sands
Loch of Strathbeg	Loch of Strathbeg	
Lough Foyle		Faughan River and Tributaries Magilligan
Medway Estuary and Marshes	Medway Estuary and Marshes Thames Estuary and Marshes	
Mersey Estuary	Mersey Estuary	
Minsmere–Walberswick	Minsmere–Walberswick	Minsmere to Walberswick Heaths and Marshes
Montrose Basin	Montrose Basin	
Moray and Nairn Coast	Moray and Nairn Coast	Culbin Bar Lower River Spey – Spey Bay Moray Firth River Spey
Morecambe Bay	Duddon Estuary Morecambe Bay	Morecambe Bay
North Norfolk Coast	North Norfolk Coast The Wash	North Norfolk Coast The Wash and North Norfolk Coast
North Uist Machair and Islands	North Uist Machair and Islands	North Uist Machair

Ramsar Name	SPA Name	SAC Name
Northumbria Coast	Northumbria Coast Teesmouth and Cleveland Coast	Berwickshire and North Northumberland Coast Durham Coast North Northumberland Dunes
Outer Ards	Belfast Lough Outer Ards Strangford Lough	Strangford Lough
Pagham Harbour	Pagham Harbour	
Pevensey Levels		
Poole Harbour	Poole Harbour	Dorset Heaths (Purbeck and Wareham) and Studland Dunes
Portsmouth Harbour	Portsmouth Harbour	
Ribble and Alt Estuaries	Ribble and Alt Estuaries	Sefton Coast
Rinns of Islay	Rinns of Islay	Glac na Criche Rinns of Islay
Ronas Hill – North Roe and Tingon	Ronas Hill – North Roe and Tingon	Ronas Hill – North Roe Tingon
Severn Estuary	Severn Estuary	River Usk/ Afon Wysg River Wye/ Afon Gwy Severn Estuary/ Môr Hafren
Sléibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast)	Sléibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast)	Tiree Machair
Solent and Southampton Water	Solent and Southampton Water	Solent and Isle of Wight Lagoons Solent Maritime South Wight Maritime
South Uist Machair and Lochs	South Uist Machair and Lochs	South Uist Machair
Stour and Orwell Estuaries	Stour and Orwell Estuaries	
Strangford Lough	Outer Ards Strangford Lough	Strangford Lough
Teesmouth and Cleveland Coast	Northumbria Coast Teesmouth and Cleveland Coast	Durham Coast
Thames Estuary and Marshes	Medway Estuary and Marshes Thames Estuary and Marshes	
Thanet Coast and Sandwich Bay	Thanet Coast and Sandwich Bay	Sandwich Bay Thanet Coast
The Dee Estuary	The Dee Estuary	Dee Estuary/ Aber Dyfrdwy
The Swale	The Swale	
The Wash	Gibraltar Point North Norfolk Coast The Wash	The Wash and North Norfolk Coast
Upper Solway Flats and Marshes	Upper Solway Flats and Marshes	River Eden Solway Firth
Ythan Estuary and Meikle Loch	Ythan Estuary, Sands of Forvie and Meikle Loch	Sands of Forvie

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