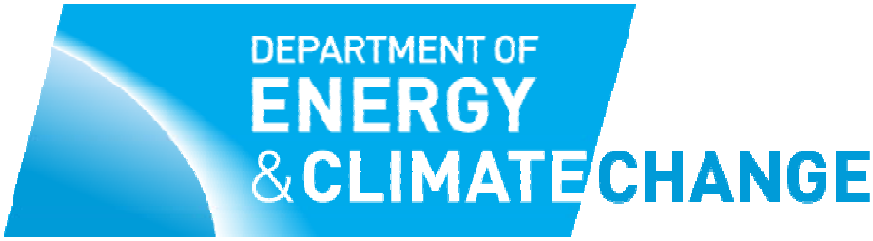


Offshore Oil & Gas Licensing

25th Seaward Round

West of Orkney and Wyville Thomson Ridge/Darwin Mounds area Blocks 164/4, 164/5, 165/1, 174/28, 174/29, 174/30, 175/26, 201/5, 202/24, 202/25, 202/29, 202/30, 203/16, 203/21, 203/26

Phase 2 Screening/ Appropriate Assessment

February 2010

CONTENTS

1 INTRODUCTION

1.1 Background and purpose

On 20th February 2008, the Secretary of State for Energy and Climate Change (through the Department of Energy and Climate Change, DECC) (then as the Secretary of State for Business, Enterprise and Regulatory Reform, BERR) invited applications for licences in the 25th Seaward Licensing Round.

To comply with obligations under the *Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001* (as amended) (OPAR 2001), in summer 2008, the Secretary of State undertook a screening assessment to determine whether the award of any of the Blocks applied for would be likely to have a significant effect on a relevant European conservation site, either individually or in combination with other plans or projects (DECC 2008).

In so doing, the test set out by the European Court of Justice in the ***Waddenzee*** case (Case C-127/02) was applied, as follows:

> Any plan or project not directly connected with or necessary to the management of a site must be subject to an Appropriate Assessment 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.

An initial screening assessment (including consultation with the statutory agencies/bodies), identified 46 Blocks as requiring further assessment prior to decisions on whether to grant licences. Because of the wide distribution of these Blocks around the UKCS, the second phase of screening and, where necessary, the Appropriate Assessments (AA) in respect of each potential licence award are contained in four regional reports as follows:

- Southern North Sea
- Eastern Irish Sea
- Outer Moray Firth
- West of Orkney and the Wyville Thomson Ridge/Darwin Mounds area.

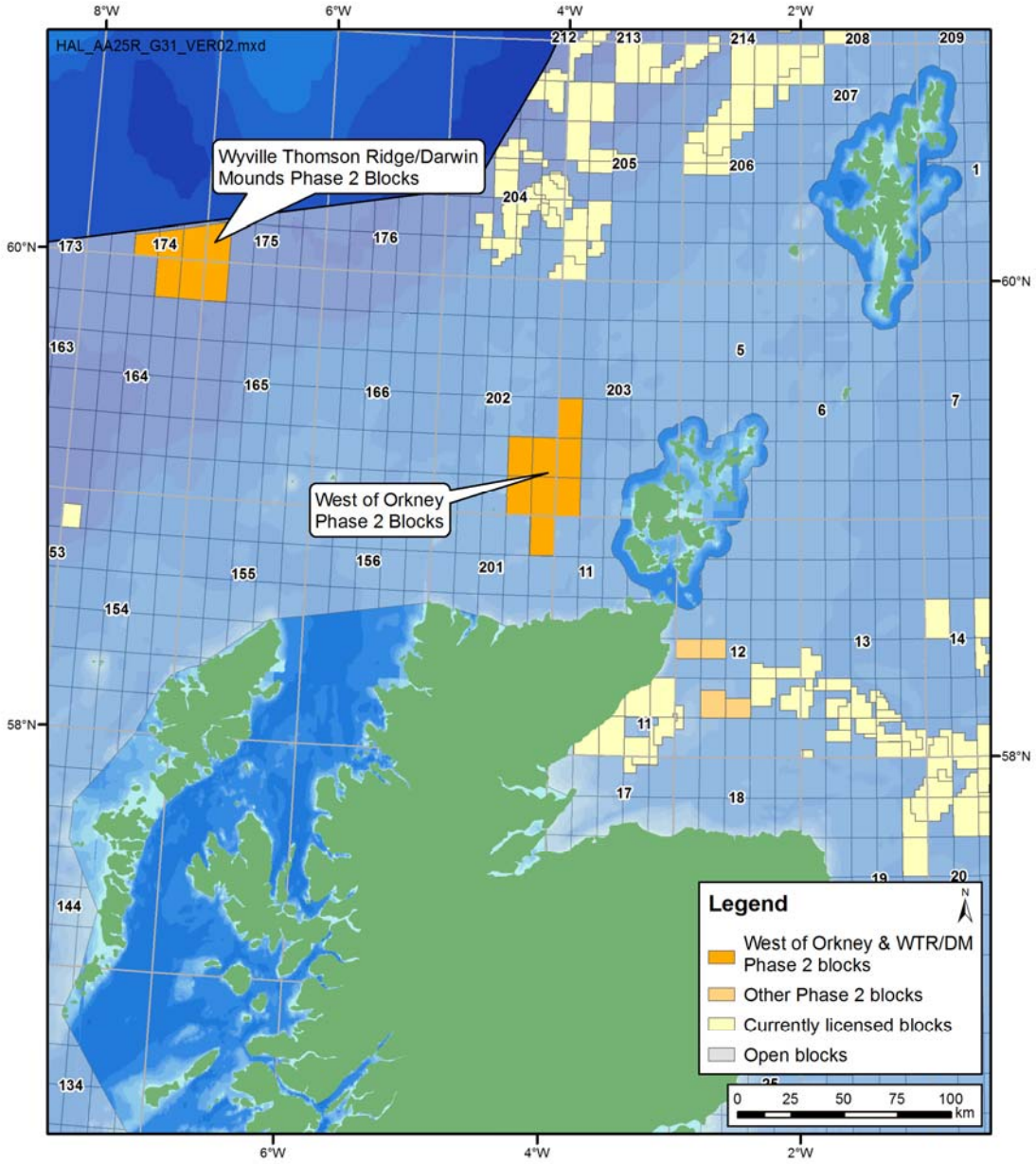
This report documents the further assessment in relation to 15 Blocks in the west of Orkney and Wyville Thomson Ridge/Darwin Mounds (WTR/DM) area (see Section 1.2).

1.2 West of Orkney and Wyville Thomson Ridge/Darwin Mounds Blocks

The west of Orkney and WTR/DM Blocks applied for in the 25th Round and considered in this document are listed below and shown in dark orange in Figure 1.1 overleaf.

164/4	174/28	175/26	202/25	203/16
164/5	174/29	201/5	202/29	203/21
165/1	174/30	202/24	202/30	203/26

Figure 1.1 – Location of west of Orkney and WTR/DM Blocks



2 LICENSING AND ACTIVITY

2.1 Licensing

The exclusive rights to search for, 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* gives the Secretary of State the power to grant licences to explore for and exploit such petroleum. A Seaward Production Licence grants exclusive rights to the holders "to search and bore for, and get, petroleum" in the area covered by the licence, which may be the whole or part of a specified Block or a group of Blocks.

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.

- **Frontier Production Licences** are a variation of the Traditional Production Licence with four Terms rather than three. A Frontier Production Licence has a longer exploration phase (six years as opposed to four) with the objective of allowing companies to screen larger areas, during a three year Initial Term so they can look for a wider range of prospects. At the end of the Initial Term, the Licensee must relinquish 75% of the licensed acreage. The Second Term lasts three years at the end of which (i.e. when the licence is six years old), 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). In this sense, the end of a Frontier Licence's Second Term corresponds to the end of a Traditional Licence's Initial Term.

- In the 21st Offshore Oil and Gas Licensing Round (2002) the then Department of Trade and Industry 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.

- The terms and conditions of the licences to be granted in this Licensing Round are contained in the *Petroleum Licensing (Production) (Seaward Areas) Regulations 2008* (SI 2008/225).

It is noted that the environmental management capacity and track record of applicants is explicitly examined by DECC, by way of written submissions and interviews, before licences are awarded.

2.2 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 conditional 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 only result in an actual well being drilled in less than 50% of the cases.

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. Field activities, such as 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 approach used here has been to take the proposed activity for a given Block as being the maximum of any application for that Block, and to assume that all activity takes place as a result of the structuring of licences. The estimates of work commitments for the Blocks derived by DECC from the range of applications received are as follows:

- 164/4 (part)[1], 164/5 (part), 165/1 (part), 174/28, 174/29, 174/30 & 175/26 (part) - acquire MMT[2], D/D well (Traditional)
- 201/5, 202/24, 202/25, 202/29, 202/30, 203/16, 203/21 & 203/26 - obtain & reprocess 2D seismic, D/D well (Frontier)

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.

[1] Part Blocks are those where a Company has only requested a portion of the available Block.
[2] MMT survey = marine magnetotelluric survey (a technique for hydrocarbon exploration which uses natural time-dependant variations in the Earth's magnetic field as the source, and electric fields induced in the earth as output, see http://marineemlab.ucsd.edu/resources/concepts/mtsalt.html).

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). Discoveries that are developed may require further drilling, wellhead infrastructure, pipelines and possibly production facilities such as platforms, although most recent developments are tiebacks to existing production facilities rather than stand alone developments.

The extent and timescale of development, if any, which may ultimately result from the licensing of these Blocks is therefore uncertain.

3 RELEVANT NATURA 2000 SITES

Relevant Natura 2000 sites (also referred to as 'European Sites') considered in this screening/assessment include those whose location in relation to the 15 Blocks applied for (see Section 1.2 above), indicate the possibility of interactions.

Guidance on selection of the relevant Natura 2000 sites is given by Planning Policy Statement 9 (PPS9) which states that: "*The Habitats Regulations do not provide statutory protection for potential Special Protection Areas (pSPAs) or to candidate Special Areas of Conservation (cSACs) before they have been agreed with the European Commission. For the purposes of considering development proposals affecting them, as a matter of policy, the Government wishes pSPAs and cSACs included in a list sent to the European Commission, to be considered in the same way as if they had already been classified or designated*" (ODPM 2005).

In accordance with Government policy (as set out in PPS9 and above), the relevant sites considered in this screening/assessment include classified and potential SPAs, and designated and candidate SACs. The relevant sites include:

- Coastal and marine Natura 2000 sites along the Scottish mainland coast and islands from the east Caithness coast to Rum, including Shetland, Orkney and Lewis to South Uist.
- Offshore Natura 2000 sites northwest of Scotland.
- Riverine SACs within the area for migratory fish and/or the freshwater pearl mussel.

Guidance in relation to sites which have not yet been submitted to the European Commission is given by Circular 06/2005 (ODPM 2005b) 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.*" See Sections 4 and 10 for such sites.

Summaries of the sites, together with their features of interest, are given in Appendix A (Tables A.1 to A.4) and location maps (Maps A.1-A.3).

4 SCREENING ASSESSMENT

The Phase 2 screening assessed the potential implications for Natura 2000 sites of the award of licences for the 15 UKCS Blocks listed in Section 1.2 in the 25th Licensing Round. The award of such licences may or may not give rise to subsequent development activity, the implications of which have been considered in this screening as far as possible. Where relevant, such future activities will themselves be subject to the screening procedure and tests under the Habitats Directive.

An initial screening assessment identified these Blocks as requiring further screening and potentially AA prior to licences being granted (DECC 2008). This is due to the potential for a significant effect on listed habitats or species from a consideration of the geographic location of the Blocks in relation to the sites, and the general characteristics of habitat and species present.

For all other Phase 2 Blocks west of Orkney and in the WTR/DM area, no new information has become available which would alter the conclusions of the November 2008 screening. Therefore, it is considered that the following 11 Blocks require AA: 164/4, 164/5, 165/1, 201/5, 202/24, 202/25, 202/29, 202/30, 203/16, 203/21 and 203/26.

Several of the Blocks considered in initial screening were identified as requiring further screening due to their location in relation to the boundary of the Wyville Thomson possible SAC (pSAC) (see Map A.3), and the consequent potential for physical effects. While the Wyville Thomson Ridge pSAC completed public consultation for possible SAC designation within the UK in March 2008, it has yet to be submitted to the European Commission as a cSAC; this is due to issues raised during consultation[3]. Although AA is therefore not required for this site, Paragraph 6 of Circular 06/2005 states that planning authorities should take note of such potential designation in their consideration of any planning applications that may affect such sites. The Secretary of State has taken note of this site in relation to the potential licensing of the Blocks above and a consideration of this is included. Similarly it is noted that seaward extensions to a number of the relevant seabird colony SPAs are also proposed.

[3] Latest information on the status of pSACs in UK offshore waters is available at: http://www.jncc.gov.uk/page-4535#WyvilleThomsonRidge

5 ASSESSMENT OF THE EFFECTS OF THE PROJECT OR PLAN ON SITE INTEGRITY

5.1 Process

In carrying out this AA so as to determine whether it is possible to grant licences in accordance with Regulation 5(1) of OPAR 2001 (as amended), DECC:

- Considered, on the basis of the precautionary principle, whether it could be concluded that the integrity of relevant European Sites would not be affected. This impact prediction involved a consideration of the cumulative and in-combination effects.

- Examined, in relation to elements of the plan where it was not possible to conclude that the integrity of relevant sites would not be affected, whether appropriate mitigation measures could be designed which cancelled or minimised any potential adverse effects identified.

- Produced a draft AA Report for consultation with its statutory advisors.

- Will consider whether, in the light of comments received, it is possible to go ahead with the plan.

In considering the above, DECC used the tests set out by the ECJ in the *Waddenzee* case, namely that:

- Prior to the grant of any licence all activities which may be carried out following the grant of such a licence, and which by themselves or in combination with other activities can affect the site's conservation objectives, are identified in the light of the best scientific knowledge in the field.

- A licence can only be granted if DECC has made certain that the activities to be carried out under such a licence will not adversely affect the integrity of that site. That is the case where no reasonable scientific doubt remains as to the absence of such effects.

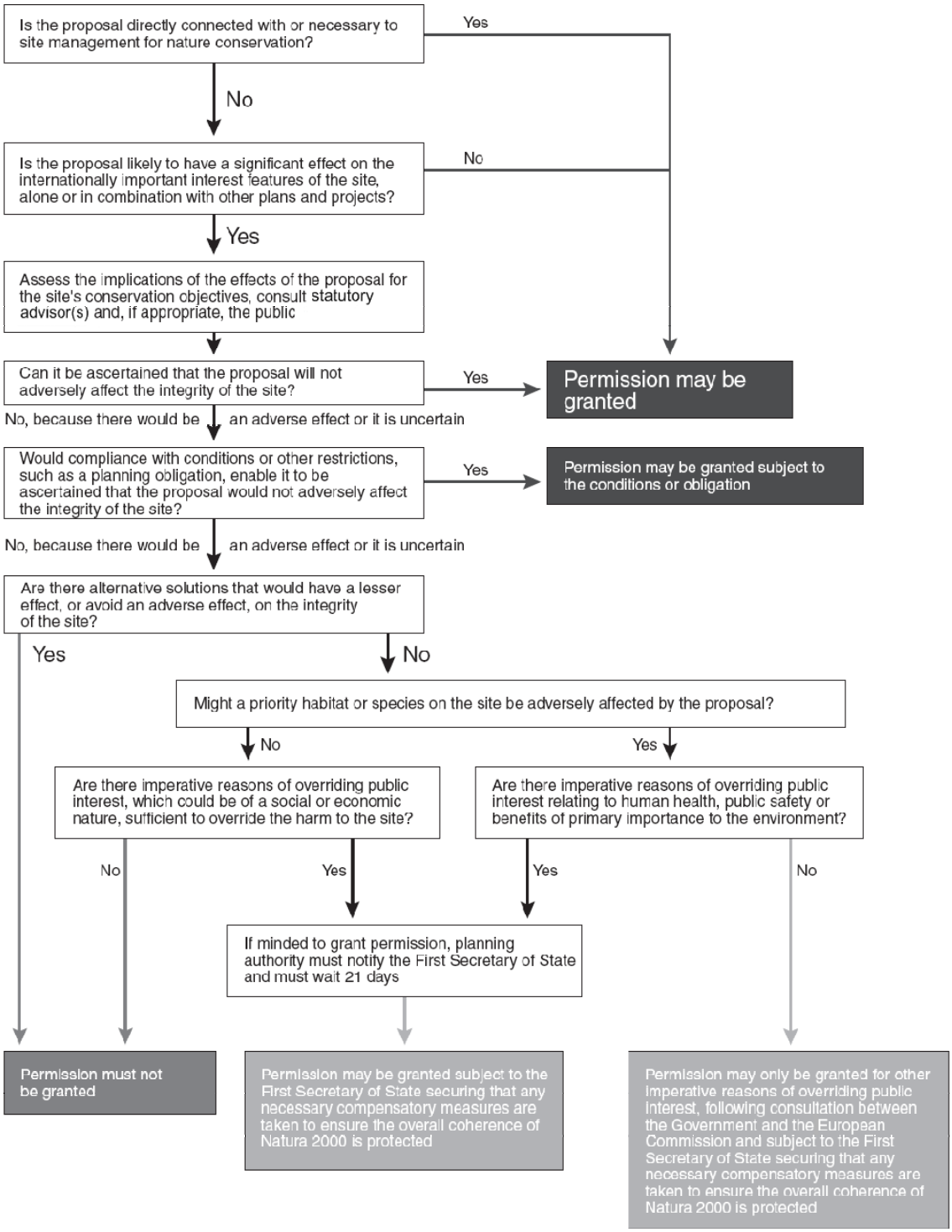
A flowchart summarising the process is shown in Figure 5.1.

Site integrity

Site integrity is defined by the ODPM Circular 06/2005 to accompany PPS9 (ODPM 2005b) as follows: "The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified." As clarified by Section 4.6.3 of the EC Guidance (2000), the integrity of a site relates to the site's conservation objectives. These objectives are assigned at the time of designation to ensure that the site continues, in the long-term, to make an appropriate contribution to achieving favourable conservation status for the qualifying interest features. For example, it is possible that a plan or project will adversely affect the integrity of a site only in a visual sense or only habitat types or species other than those listed in Annex I or Annex II. In such cases, the effects do not amount to an adverse effect for purposes of Article 6(3), provided that the coherence of the network is not affected. The AA must therefore conclude whether the proposed activity adversely affects the integrity of the site, in the light of its conservation objectives. For sites

where the potential for adverse affects has been identified, their conservation objectives are listed in full within Appendix C.

Figure 5.1 - Summary of procedures under the Habitats Directive for consideration of plans or projects affecting Natura 2000 sites



Note: 'Statutory advisor(s)' refers to the relevant statutory Government advisor(s) on nature conservation issues. Source: After ODPM (2005b).

5.2 Assessment

The approach to ascertaining the absence or otherwise of adverse effects on the integrity of a European Site is set out in Section 5.1 above. This assessment has been undertaken in accordance with the European Commission Guidance (EC 2000), and with reference to various other guidance and reports including the Habitats Regulations guidance notes (EN 1997; SEERAD 2000), the Planning and Policy Statement note 9 (ODPM 2005) and English Nature Research Reports, No 704 (Hoskin & Tyldesley (2006).

Appendix A lists, maps and summarises the relevant European Sites as defined in Section 3. Appendix B then presents the results of a screening exercise of these sites to identify the potential effects of activities that could follow the licensing of the 11 west of Orkney and WTR/DM area Blocks during the 25th Round. Where potential effects are identified, more detailed information on the relevant sites is provided in Appendix C.

Detailed assessments are made in Sections 6-9 of the implications for the integrity of the relevant European Sites and their qualifying features and species, were a licence for any of the 11 west of Orkney and WTR/DM area Blocks to be granted. The assessment is based on an indication of the potential work programme for the block and likely hydrocarbon resources if present, along with the characteristics of the relevant sites as described in the Appendices. As noted in Section 2.2, the potential work programme is taken as the maximum of any application for that Block; however, on past experience, less activity actually takes place than is bid at the licence application stage. Activities which may be carried out following the grant of a licence, and which by themselves or in combination with other activities can affect the conservation objectives of relevant European Sites, are discussed under the following broad headings:

- Oil spills (including all liquid phase hydrocarbons)
- Physical disturbance and other effects (e.g. pipeline trenching, marine discharges)
- Underwater noise (in particular, seismic surveys)
- In-combination effects (e.g. cumulative and synergistic and secondary/indirect effects).

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 includes an activities/factors matrix derived from MarLIN (www.marlin.ac.uk) where applicable. Several of the “probable” effects highlighted in the MarLIN matrices are not inevitable consequences of oil and gas exploration and production, since through the regulatory EIA and permitting processes they are mitigated by timing, siting or technology requirements (or a combination of one or more of these). There is an expectation that these options would be evaluated in the environmental assessments required as part of activity consenting.

6 CONSIDERATION OF POTENTIAL EFFECTS FROM OIL SPILLS ON RELEVANT SITES

6.1 Overview of spill effects and context

The potential for oil spills associated with exploration and production, the consequences of accidental spillages, and the prevention, mitigation and response measures implemented have been assessed and reviewed in successive SEAs covering the UKCS area under consideration in the 25th Round, including the recent Offshore Energy SEA. Previous SEAs have concluded that in relation to existing exposure to risk as a result of shipping, the incremental risk associated with exploration and production (E&P) is moderate or low.

A large number of site- and activity-specific risk assessments have also been carried out as a component of Environmental Assessments and under the relevant legislation implementing the International Convention on Oil Pollution, Preparedness, Response and Co-operation (OPRC) (see the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998).

Direct mortality of seabirds in the event of oil spill is highly relevant in the context of coastal breeding site classified as SPAs (and possible SPA extensions). Waterbird vulnerability to surface pollution has been quantified for each month on a block by block basis by JNCC in terms of the Offshore Vulnerability Index (OVI).

For activities in proximity to sensitive shorelines, the Department's guidance (DTI 2002) requires that the risk of shoreline contamination be determined through an appropriate risk assessment, and operators with oil spill scenarios that could impact the shoreline must have access to appropriate oil spill response resources suitable for shoreline clean-up operations. These resources should be capable of mobilising to prioritised locations within the estimated beaching time established through oil spill modelling under worst case conditions (normally a 30 knot onshore wind).

The following section provides a high-level overview of risks, regulation, contingency planning and response capabilities; followed by an assessment of risks presented to relevant European Sites by activities resulting from the proposed licensing of the eleven west of Orkney and WTR/DM Blocks which require AA in the 25th Round. As risks tend to be generic between sites, these have been categorised based on ecological sensitivity and an evaluation of spill probability and severity.

6.2 Spill risk

Risk assessment, under the terms of OPRC, includes considerations of probability and consequence, generally comprising an evaluation of: historical spill scenarios and frequency, fate of spilled oil, trajectory of any surface slick, and potential ecological effects. These considerations are discussed below.

Historical spill scenarios and frequency

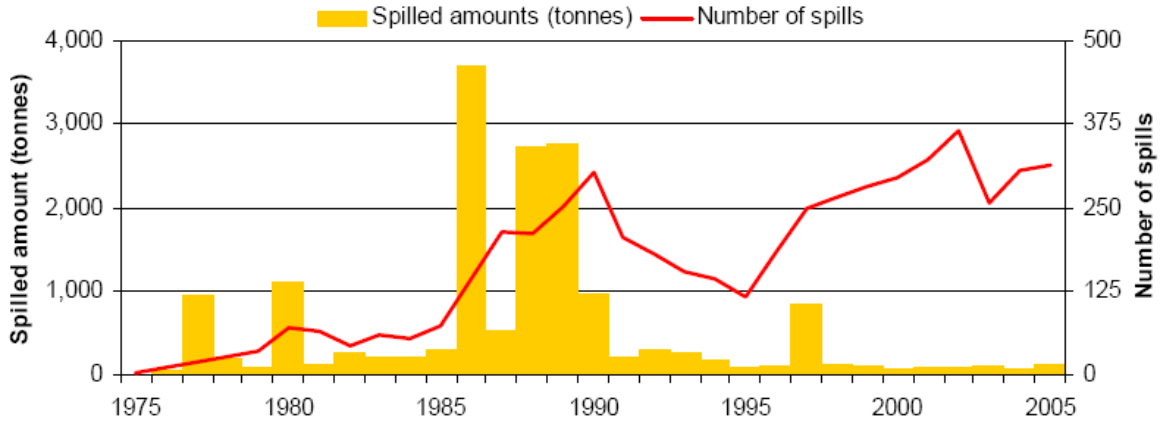
Hydrocarbon spills have been reported from exploration and production facilities on the UKCS since 1974 under PON1 (formerly under CSON7). Well control incidents (i.e. "blowouts" involving uncontrolled flow of fluids from a wellbore or wellhead) have been too infrequent on the UKCS for a meaningful analysis of frequency based on historic UKCS

data. The only significant blowouts on the UKCS to date have been from West Vanguard (1985) and Ocean Odyssey (1988), both involving gas.

The major types of spill from mobile drilling rigs have been organic phase drilling fluids (and base oil), diesel and crude oil. Topsides couplings, valves and tank overflows; and infield flowlines and risers are the most frequent sources of spills from production operations, with most spills being <1 tonne. A large proportion of reported oil spills in recent years (since about 1990) have resulted from process upsets (leading to excess oil in produced water).

Analysis of statistics of oil spills from the oil and gas industry (UKOOA 2006) showed that from 1975 to 2005, for every million tonnes of oil equivalents (TOE) produced on the UKCS, an average of 0.94 spills occurred, and with those the discharge of 3.06 tonnes of oil. An increasing trend in the number of reported spills occurred over the period 1975-1990 followed by a downward trend from 1991-1995 and an upward trend thereafter (see Figure 6.1). The latter trend reflects a lower level of overall production with an increasing number of smaller fields (UKOOA 2006).

Figure 6.1 - Number and volume of reported oil spills from UKCS oil and gas installations over the period 1975-2005



Source: UKOOA (2006)

Over the period 1975-2005, 46% of all oil spills were of crude oil, 18% diesel, 8% hydraulic oil, 4% oily water, 2% condensate and 8% of unknown type. The relative number of diesel, condensate and hydraulic oil spills has increased over the past 10 years. A shift can also be observed towards smaller oil spill volumes over the years. In the period 1975-1981, most spills were between 1 and 10 tonnes; between 2000 and 2005, most spills were between 1 and 100kg. This indicates that the oil spill risk (a function of likelihood and spill size) of the offshore oil and gas industry has reduced over the years. This trend is even clearer when the data are normalised against the number of fields in production (UKOOA 2006).

An annual review of reported oil and chemical spills in the UKCS – covering both vessels and offshore installations – is made on behalf of the Maritime and Coastguard Agency (MCA) by the Advisory Committee on Protection of the Sea (e.g. ACOPS 2008). This includes all spills reported by POLREP reports by the MCA and PON1 reports to DECC. A total of 280 accidental discharges were attributed to oil and gas installations during 2007; this figure is the same as the mean annual total over the period 2000-2006. Of these 280 discharges, 65% were fuel, lubrication or hydraulic oils; additionally, of the 276 discharges with volume information, 95% were less than 455 litres. A total of 42 discharges of 2 tonnes or more originating from offshore oil and gas installations were reported during 2007; the

vast majority of these consisted of non-oil chemicals and hydraulic fluids, with only 6.62 tonnes of crude, 3.67 tonnes of diesel and 51.86 tonnes of OBM spilled (ACOPS 2008).

Since the mid-1990s, the reported number of spills has increased, consistent with more rigorous reporting of very minor incidents (e.g. the smallest reported spill in 2003 was 0.0001 litres). However, the underlying trend in spill quantity (excluding specifically-identified large spills) suggests a consistent annual average of around 100 tonnes. In comparison, oil discharged with produced water from the UKCS in 2006 totalled 4,356 tonnes.

Historic major spill events from UKCS production facilities include the 1986 Claymore pipeline leak (estimated 3,000 tonnes), 1988 Piper Alpha explosion (1,000 tonnes), 1996 Captain spill (685 tonnes) and 2000 Hutton TLP spill (450 tonnes). Although potentially significant at a local scale, these volumes are minor when compared to other inputs of oil to the marine environment, such as riverine inputs (OSPAR 2000).

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 anticipated reservoir hydrocarbon type in the west of Orkney and WTR/DM area Blocks is oil. 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 without the need for intervention. A major diesel spill of approximately 1,000 tonnes would disperse naturally in about 8 hours and travel some 24km under extreme conditions of a constant unidirectional 30 knot wind.

Coincident with these weathering processes, surface and dispersed oil will be transported as a result of tidal (and other) currents, wind and wave action. Although strong winds can come from any direction and in any season, the predominant winds in the UK are from the southwest which, for the southern west of Orkney Blocks, would push spilled oil north and east towards the coast of Orkney and, for northern west of Orkney Blocks, would push oil north and east along and north of the northeast coast of Orkney. To support environmental assessments of individual drilling or development projects, modelling is usually carried out for a major crude oil release, corresponding to a blowout, and for smaller diesel or fuel oil releases, which are expected to be less persistent. Representative modelling cases from various parts of the UKCS, including west of Orkney and the WTR/DM area, have been reviewed by successive SEAs.

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. Seabirds are affected by oil pollution in several ways, including oiling of plumage resulting in the loss of insulating properties and the ingestion of oil during preening. Pollution of the sea by oil, predominantly from merchant shipping, can be a major cause of seabird mortality. Although locally important numbers of birds have been killed on the UKCS directly by oil spills from tankers, for example common scoter off Milford Haven following the Sea Empress spill in 1996, population recovery has generally been rapid. Chronic pollution resulting from illegal dumping or tank washing probably has a greater chronic impact on seabirds than accidental spills from shipping casualties.

The Offshore Vulnerability Index (OVI) developed by JNCC (Williams *et al*. 1994) is used to assess the vulnerability of bird species to surface pollution; it considers four factors:

- the amount of time spent on the water
- total biogeographical population
- reliance on the marine environment
- potential rate of population recovery

Vulnerability scores for offshore areas are determined by combining the density of each species of bird present with its vulnerability index score. 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. In contrast, the aerial habits of the fulmar and gulls, together with large populations and widespread distribution, reduce vulnerability of these species.

As the major breeding areas for most wildfowl and wader species are outside the UK (in the high Arctic for many species), population dynamics are largely controlled by factors including breeding success (largely related to short-term climate fluctuations, but also habitat loss and degradation) and migration losses. Other significant factors include lemming abundance on arctic breeding grounds (e.g. white-fronted goose). Variability in movements of wintering birds, associated with winter weather conditions in continental Europe, can also have a major influence on annual trends in UK numbers, as can variability in the staging stops of passage migrants.

Oil spill risks to marine mammals have been reviewed by successive SEAs and their supporting technical reports (e.g. Hammond *et al*. 2008, Murphy *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. Symptoms from acute exposure to volatile hydrocarbons include irritation to the eyes and lungs, lethargy, poor coordination and difficulty with breathing. Individuals may then drown as a result of these symptoms.

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 common seals) and particularly the pupping season (October-December in grey seals and June-July in common seals). Animals most at risk from oil coming ashore on 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.

Coastal otter populations are also vulnerable to fouling by oil, should it reach nearshore habitats. They are closely associated with the sea surface and reliant upon fur, rather than blubber, for insulation.

Direct mortality of seals as a result of contaminant exposure associated with major oil spills has been reported, e.g. following the *Exxon Valdez* oil spill in Alaska in 1989. Animals exposed to oil over a period of time developed pathological conditions including brain lesions. Additional pup mortality was reported in areas of heavy oil contamination compared to un-oiled areas.

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. Studies of macrobenthic infauna following the *Braer* spill (Kingston *et al*. 1995), which occurred under such conditions, found no significant changes in benthic community structure as characterised by species richness, individual abundance and diversity, which could be related to the areas of seabed affected by the spill. This may have been because *Braer* oil was of low toxicity, or because the sampling programme was carried out too soon after the spill to enable the full effects of its impact to be detected. In recognition of this as part of the DECC SEA programme further sampling of the study area has been conducted, ten years after the spill, results from which have indicated a substantial decline in sediment hydrocarbon concentrations.

In contrast, evidence from the *Florida* barge spill (Buzzards Bay, Massachusetts, September 1969, in which 700m^3 of diesel fuel were released) suggests that in certain circumstances, contamination from oil spills could be long-term. Monitoring immediately following the spill suggested rapid recovery (reviewed by Teal & Howarth 1984), while subsequent studies (sampling in 1989) indicated that substantial biodegradation of aromatic hydrocarbons in saltmarsh sediments had occurred (Teal *et al.* 1992). However, thirty years after the spill, significant oil residues remain in deep anoxic and sulphate-depleted layers of local salt marsh sediments (Reddy *et al*. 2002, Peacock *et al*. 2005). The ecological consequences of this residual contamination are unclear, although there is potential for remobilisation of sediment-bound contaminants through bioturbation or storm events (in which case, aerobic biodegradation would be expected to be rapid).

Those coastal and marine Annex I habitats which are most sensitive to oil spills are identified in Table 6.1, below. Generally, sheltered habitats of lower exposure to wave energy are considered most vulnerable; oil may persist for considerable periods of time in such environments.

6.3 Implications for relevant European Sites

Potentially affected sites have been screened in Appendix B and all sites where the potential for effects were identified are listed in detail in Appendix C. The identification of potential effects from oil spills on specific European Sites considers the following factors:

- The ecological sensitivity of the qualifying feature(s) to oil spills
- Oil spill probability and severity (taking into account distance from blocks under offer, and probable hydrocarbon type)

Special Areas of Conservation

The ecological sensitivity of the qualifying features of relevant sites to oil spills varies. Several Annex I habitats and Annex II species are not considered to be particularly vulnerable and are not considered further in this assessment; these include:

- **Submerged reefs and sandbanks** – not generally vulnerable to surface oil pollution, except possibly following application of chemical dispersants (generally not permitted in waters shallower than 20m).
- **Lagoons, dunes** – sites above Mean High Water Springs not generally vulnerable to surface oil pollution, except possibly to wind-blown oil or evaporated hydrocarbons.

- **Sea cliffs, sea caves** – generally not considered sensitive due to wave reflection and rapid recovery (e.g. Gundlach & Hayes 1978).
- **Migratory fish** – not generally vulnerable to surface oil pollution due to the absence or paucity of time spent at the water's surface.
- **Terrestrial and freshwater aquatic species** – generally not considered vulnerable to surface oil pollution as not utilising marine or estuarine environments. Includes: narrow-mouthed whorl snail (*Vertigo angustior*), freshwater pearl mussel (*Margaritifera margaritifera*), and non-coastal otter populations (*Lutra lutra*).

Table 6.1 provides information on those categories of Annex I habitats and Annex II species which are potentially vulnerable to oil spills. Those sites where the potential for effects from fuel and/or crude oil spills has been identified (see Appendix B) are listed. The Blocks under consideration form two distinct groups which are separated by a large distance (approximately 150km). Table 6.1 identifies sites which are considered potentially vulnerable to oil spills originating from one or more of these groups of Blocks. Within a specific group, site vulnerability is considered relevant for all individual Blocks within that group due to their relatively close proximity to each other. Note: several sites are represented in more than one risk category.

Table 6.1 - Annex I habitat types and Annex II species potentially vulnerable to oil spills

Mudflats and sandflats
Particularly vulnerable in sheltered areas where wave energy is low. The biological communities associated with these sites are related to the degree of sheltering and subsequent sediment type; sheltered sites with fine, muddy sediments may support a high diversity and abundance of invertebrates and waterfowl. **Sites potentially at risk:** Sanday SAC, Loch nam Madadh SAC
Estuaries
Complexes of several subtidal and intertidal habitats with varying freshwater influence. The sediments of estuaries support various biological communities, while the water column provides an important habitat for free-living species, such as fish, and juvenile stages of benthic plants and animals. Estuaries often contain several different Annex I habitats. **Sites potentially at risk:** none
Saltmarshes
Comprise intertidal mud and sandflats colonised by vegetation due to protection from strong wave action. Pioneering saltmarsh vegetation exists where tidal flooding is frequent, with progression to more diverse, stable communities in upper reaches where tidal flooding is less frequent. Upper reaches can be valuable for plants, invertebrates and wintering or breeding waterfowl. **Sites potentially at risk:** none
Inlets and Bays
Large indentations of the coast, and generally more sheltered from wave action than the open coast. They are relatively shallow, with water depth rarely exceeding 30m, and support a variety of subtidal and intertidal habitats and associated biological communities. **Sites potentially at risk:** Sullom Voe SAC, Loch nam Madadh SAC, Loch Laxford SAC
Bottlenose dolphins
Sites comprise a variety of marine habitats utilised by bottlenose dolphins (*Tursiops truncatus*) for foraging and other activities, with extensive areas beyond the site boundary also utilised. Vulnerable to oil spills due to their dependence on the sea surface for breathing.

Sites potentially at risk: none
Seals
Designated sites comprise coastal habitats (beaches, estuaries, sandflats and rocky shores) supporting important breeding colonies of common seals (*Phoca vitulina*) and/or grey seals (*Halichoerus grypus*). Seals spend considerable periods of time at these sites during the breeding season and during the moult. Seals forage for prey in surrounding waters and also travel considerable distances beyond the boundaries of sites (particularly grey seals). **Sites potentially at risk:** Yell Sound Coast SAC, Mousa SAC, Faray and Holm of Faray SAC, Sanday SAC, North Rona SAC, Monach Islands SAC, Ascrib, Isay and Dunvegan SAC
Coastal otters
Sites contain shallow, inshore coastal areas utilised by important populations of otter (*Lutra lutra*) for feeding. **Sites potentially at risk:** Yell Sound Coast SAC, Durness SAC, Loch nam Madadh SAC

Special Protection Areas

Table 6.2 provides information on those SPA types which are potentially vulnerable to oil spills. Those sites where the potential for effects from fuel and/or crude oil spills has been identified (see Appendix B) are listed. Due to the distribution of the Blocks under consideration into two distinct groups which are separated by a large distance (approximately 150km), Table 6.2 identifies the group(s) of Blocks from which the site is considered potentially vulnerable to oil spills. Within a specific group, site vulnerability is considered relevant for all individual Blocks within that group due to their relatively close proximity to each other. Note: several sites are represented in more than one risk category.

Note: while Switha SPA and Caithness Lochs SPA fall under the category of *firths, lochs and estuaries supporting wintering waterfowl*, they are not considered to be vulnerable to oil spills and are not listed in Table 6.2. The qualifying geese and swan species use the sites for roosting and primarily forage in surrounding agricultural and freshwater wetland habitats; their use of adjacent marine environments is very limited. In addition, transport of surface oil via the Minch to sites south of Skye is considered extremely improbable and therefore Canna and Sanday SPA and Rum SPA are not considered vulnerable to oil spills from the West of Orkney and WTR/DM blocks.

Table 6.2 - SPA types potentially vulnerable to oil spills

Cliff-breeding seabird colonies
Designated for colonial breeding seabirds (including auks, fulmar, kittiwake, cormorant, and gannet) which nest either on, or generally associated with sea cliffs. Birds extensively utilise adjacent coastal waters for a variety of activities, and also forage beyond site boundaries. In Scotland, these sites are typically subject to proposed seaward extensions of 1-2km. **Sites potentially at risk:** Foula SPA, Hermaness, Saxa Vord and Valla Field SPA, Noss SPA, Fair Isle SPA, Marwick Head SPA, Calf of Eday SPA, Copinsay SPA, Sule Skerry and Sule Stack SPA, North Caithness Cliffs SPA, East Caithness Cliffs SPA, North Rona and Sula Sgeir SPA, Flannan Isles SPA, St Kilda SPA, Mingulay and Berneray SPA, Handa Island SPA, Shiant Isles SPA
Petrel, tern, skua or gull breeding populations
Designated for breeding seabirds, which generally forage over sea areas adjacent to (or in some cases at considerable distance from) breeding sites. In Scotland, several of these sites are subject to proposed seaward extensions. **Sites potentially at risk:** Sumburgh Head SPA, Foula SPA, Ronas Hill-North Roe and Tingon SPA,

Ramna Stacks and Gruney SPA, Hermaness, Saxa Vord and Valla Field SPA, Fetlar SPA, Noss SPA, Mousa SPA, Fair Isle SPA, Pentland Firth Islands SPA, Hoy SPA, Rousay SPA, West Westray SPA, Papa Westray (North Hill and Holm) SPA, Auskerry SPA, Copinsay SPA, Sule Skerry and Sule Stack SPA, East Caithness Cliffs SPA, North Rona and Sula Sgeir SPA, Flannan Isles SPA, St Kilda SPA, Monach Isles SPA, South Uist Machair and Lochs SPA, Priest Island SPA
Red-throated diver breeding populations utilising coastal waters
Inland sites designated for breeding red-throated diver (*Gavia stellata*) which forage in neighbouring coastal waters. **Sites potentially at risk:** Foula SPA, Ronas Hill-North Roe and Tingon SPA, Otterswick and Graveland SPA, Hermaness, Saxa Vord and Valla Field SPA, Orkney Mainland Moors SPA, Hoy SPA, Caithness and Sutherland Peatlands SPA, Mointeach Scadabhaigh SPA
Open coastline supporting wintering waders and seaduck
Contain coastal and intertidal habitats which support a variety of wintering waders and seaduck, often in large aggregations. The birds feed on wetlands and the surrounding shallow waters. **Sites potentially at risk:** East Sanday Coast SPA, North Uist Machair and Islands SPA, South Uist Machair and Lochs SPA
Firths, lochs and estuaries supporting wintering waterfowl
Contain enclosed and semi-enclosed coastal and intertidal habitats (particularly wetlands) supporting a variety of wintering waterfowl and waders, often in large aggregations. Some species (e.g. seaducks) feed beyond the boundaries of sites. **Sites potentially at risk:** none

6.4 Regulation, contingency planning and response capabilities

Spill prevention and mitigation measures are implemented for offshore exploration and production inter alia through the *Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation) Regulations 1998* and the *Offshore Installations (Emergency Pollution Control) Regulations 2002*. The required measures include spill prevention and containment measures, risk assessment and contingency planning.

Offshore, primary responsibility for oil spill response lies with the relevant Operator, although the Secretary of State's Representative may intervene if necessary. The Maritime and Coastguard Agency is responsible for a National Contingency Plan and maintains four Emergency Towing Vessels stationed around the UK, which remain on standby at sea. In addition, the MCA maintains a contractual arrangement for provision of aerial spraying and surveillance, with aircraft based at Coventry and Inverness. Within two days, aircraft can deliver sufficient dispersant to treat a 16,000 tonne spill within 50 miles of the coast anywhere around the UK. DECC is a partner in this arrangement and undertakes regular aerial surveillance of offshore installations. MCA holds 1,400 tonnes of dispersant stockpiled in 14 locations around the UK, in addition to counter-pollution equipment (booms, adsorbents etc.) which can be mobilised within 2-12 hours depending on incident location.

Similar response capabilities, providing a tiered response capability, must be available to Operators prior to commencing drilling or production activities. These provisions are made under various long-term commercial contracts with specialist contractors, supplemented where necessary (e.g. for remote locations) with additional stockpiles. Site-specific Oil Spill Contingency Plans must also be submitted to DECC for approval prior to operations. Additional conditions can be imposed by DECC, through block-specific licence conditions (i.e. "Essential Elements").

6.5 Implications for European Sites

Individual European Sites have been categorised in terms of potential vulnerability, based on location and known hydrocarbon prospectivity of proposed licence blocks and therefore the nature and magnitude of credible risks. Two categories of vulnerability were identified:

- Some sites are considered to be at low risk with the potential for impacts from significant spills of crude oil, bunker or lube oil.
- Many sites are considered not to be at risk of oil spills associated with activities in proposed blocks, due to location and sensitivity of features.

The incremental risk associated with activities resulting from the proposed licensing (i.e. additional to existing risk; primarily associated with shipping and other maritime activities) is very low. This results from the combination of low probability and low severity (since most spills would be relatively small). The overall risks of a major crude oil spill, which would require catastrophic loss of well control, are quantitatively and qualitatively comparable to those considered ALARP (As Low As Reasonably Practicable) under the relevant health and safety regulations. The activities which could reasonably be expected to follow from the proposed licensing would not have a significant effect on the existing risks associated with other activities.

Following licensing, specific activities considered to present a risk to European Sites would be evaluated by DECC under mandatory contingency planning and Appropriate Assessment procedures. In all cases, rigorous spill prevention, response and other mitigation measures are implemented for offshore exploration and production. For these reasons it is considered that suitable plan level mitigation is already in place but following consultation feedback site specific consideration of the Sule Skerry and Sule Stack SPA is given below.

Sule Skerry and Sule Stack SPA

One of the Blocks applied for in the west Orkney group (202/29) overlaps with the site boundary (see Map A.1). The site is designated for Article 4.1 species (breeding storm-petrel and Leach's storm-petrel) and Article 4.2 species (breeding gannet, puffin and shag) and the site regularly supports a breeding assemblage of 100,000 individual seabirds (the status of all the species are favourable maintained - see Appendix C). The site conservation objectives include avoidance of significant disturbance to the qualifying species and deterioration of the habitats. Although large oil spills are unlikely (as described above) accidents cannot be ruled out. However, the mandatory Habitats Regulations Assessment procedures will allow further consideration of the nature, timing and location of any planned activities and the identification of mitigation measures deemed necessary (including conditions attached to consents/permits, for example, avoidance of exploration activities during the breeding season, or potentially consent/permit refusal).

6.6 Conclusions

Oil spills can have potentially adverse effects, and are controlled in direct proportion to this by a legal framework that minimises their occurrence, provides for contingency planning, response and clean up, and which enables prosecutions. It is not possible to say that in spite of the regulatory controls and other preventative measures, an oil spill will never occur as a result of 25th Round licensing in the west of Orkney and WTR/DM area; however, as oil spills are not intended activities, a risk-based assessment is appropriate.

Given the availability of mitigation measures, DECC considers that exploration and production activities that could follow the licensing of Blocks 164/4, 164/5, 165/1, 201/5, 202/24, 202/25, 202/29, 202/30, 203/16, 203/21 and 203/26, in so far as they may cause oil spills, will not adversely affect the integrity of European Sites.

7 CONSIDERATION OF SITES AND POTENTIAL PHYSICAL AND OTHER EFFECTS

7.1 Introduction

Several activities associated with oil and gas exploration and production can lead to physical disturbance, damage, alteration or contamination of seabed habitats and geomorphological features, with consequent effects on benthic communities. The prime potential sources of effect are summarised below, followed by a consideration of the foreseeable effects on European Sites assessed to be at potential risk.

7.2 Physical damage at the seabed

The main relevant 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, and cause seabed disturbance from the anchors and chain or cables, and in cohesive sediments, leave 'anchor mounds' after their retrieval.

- **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.

- **Production platform jacket installation**. Limited physical footprint similar to a drilling rig, but present on site for longer period. Physical disturbance associated with platform removal during decommissioning is comparable to that of installation.

- **Subsea template and manifold installation**. Limited physical footprint at seabed, smaller than a drilling rig, but present on site for longer period. Physical disturbance associated with subsea template and manifold removal during decommissioning is comparable to that of installation.

- **Pipeline, flowline and umbilical installation, trenching and potentially, placement of rock armour**. Anticipated hydrocarbons are oil and, given the location of the Blocks applied for in relation to the existing pipeline and infrastructure network, it is likely that any new field developments would require new infrastructure and potentially export pipeline systems. Large pipes (greater than 16" diameter) do not have to be trenched according to a general industry agreement as they will not be moved by fishing gear, but they may still need to be trenched for reasons of temperature loss or upheaval buckling (due to buoyancy). Trenches may require several passes before they are of the required depth, or it may be impossible to achieve the required depth due to obstructions, in which case rock is usually placed on the pipeline (rock dump) to protect and stabilise it.

Oil and gas SEAs have compared the physical disturbance effects of oilfield activities to those of fishing and natural events in shallow water (e.g. storm wave action), and concluded that oilfield effects are typically minor on a regional scale. It is generally accepted that the principal source of human physical disturbance of the seabed and seabed features, is bottom trawl fishing. Trawl scarring is a major cause of concern with regard to conservation of shelf and slope habitats and species (e.g. Witbaard & Klein 1993, de Groot and Lindeboom 1994, Kaiser *et al*. 2002a, Kaiser *et al*. 2002b, Gage *et al*. 2005). On the basis that seabed disturbance is qualitatively similar to the effects of severe storms, sand and gravel habitat recovery from the processes of anchor scarring, anchor mounds and cable scrape is likely to be relatively rapid (1-5 years) in most shallower and exposed (as opposed to sheltered) areas.

Understanding of the distribution of biotopes of conservation importance is highly variable in waters northwest of Scotland. Shelf waters, including those west of Orkney, are relatively well understood. Several small areas of potential Annex I stony/bedrock reef are identified to the west of Orkney, although they have not been identified as features of particular conservation importance and are not currently under further investigation as an 'Area of Search' with regard to future offshore SACs[4]. Due to more limited survey effort, understanding of the distribution of biotopes of conservation importance in deeper waters further offshore is generally less and of coarser resolution in comparison to shelf waters. However, due to the identification of extensive areas of Annex I reef habitats over the Darwin Mounds and Wyville Thomson Ridge, these areas have been studied in greater detail.

The Darwin Mounds are currently designated a cSAC, and an assessment of the potential for physical effects on this site is provided below. The Wyville Thomson Ridge, while containing extensive Annex I stony and bedrock reef habitats, is currently designated as a pSAC and is therefore not subject to AA at present; however, see the assessment and recommendations, including mitigation, in the Offshore Energy SEA (DECC 2009).

The routine sources of potential physical damage are controlled by a range of statutory measures including Consent to Locate, PON15B, Environmental Statement, Pipeline Works Authorisation and, where relevant, AA. Based on the results of the assessments including AA, DECC may require additional mitigation measures to avoid or minimise any adverse effects, or where this is not possible, refuse consent.

7.3 Marine discharges

As described in previous oil and gas SEAs, marine discharges from exploration and production activities include produced water, sewage, cooling water, drainage, drilling wastes and surplus water based mud (WBM), which in turn may contain a range of hydrocarbons in dissolved and suspended droplet form, various production and utility chemicals, metal ions or salts (including Low Specific Activity radionuclides). In addition to these mainly platform-derived discharges, a range of discharges is associated with operation of subsea infrastructure (hydraulic fluids), pipeline testing and commissioning (treated seawater), and support vessels (sewage, cooling and drainage waters). Discharges from offshore oil and gas facilities have been subject to increasingly stringent regulatory controls over recent decades, and oil concentrations in the major streams (drilling wastes and produced water) have been substantially reduced or eliminated. The effects of marine discharges are judged to be negligible in the context of proposed licensing and the Natura 2000 sites in the area and are not considered further here. They would also be considered

[4] For further details on the distribution of potential marine Annex I habitat and Areas of Search for offshore SACs, see: http://www.jncc.gov.uk/page-4538

in detail in project specific Environmental Statements, AAs (where necessary) and chemical risk assessments under existing permitting procedures.

7.4 Other effects

Through the transport and discharge of vessel ballast waters (and associated sediment), and to a lesser extent fouling organisms on vessel/rig hulls, non-native species may be introduced to the marine environment. Should these introduced species survive and form established breeding populations, they can exert a variety of negative effects on the environment. These include: displacing native species by preying on them or out-competing them for resources such as prey and habitat; irreversible genetic pollution through hybridisation with native species; increased occurrence of toxic algal blooms. The economic repercussions of these ecological effects can also be very significant. In response to these risks, a number of technical and procedural measures have been proposed (such as the use of ultraviolet radiation to treat ballast water) or introduced such as a mid-ocean exchange of ballast water (the most common mitigation against introductions of non-native species). International management of ballast waters is addressed by the International Maritime Organisation (IMO) through the International Convention for the Control and Management of Ships Ballast Water & Sediments, which was ratified in 30 States in 2005. The Convention includes regulations with specified technical standards and requirements (IMO Globallast website).

The potential negative effects of light on birds have been raised in connection with offshore oil and gas over a number of years (e.g. Wiese *et al*. 2001). As part of navigation and worker safety, oilfield installations and associated vessels are lit at night and the lights will be visible at distance (some 10-12nm in good visibility). Furthermore, the flaring of hydrocarbons generates a bright light which may also be visible over a considerable distance. However, in view of the distance of the Blocks from the island and coastal SPAs, and the potential for mitigation, it is concluded that light effects will not affect site integrity.

Physical disturbance of seaduck and other waterbird flocks by vessel and aircraft traffic associated with oil and gas exploration and production is possible, particularly in SPAs established for shy species such as common scoter. Such disturbance can result in repeated disruption of bird feeding, loafing and roosting. As with light, it is considered this source of potential effect will not result in significant effects at Natura 2000 sites because of the location of the SPAs and pSPAs relative to the Blocks applied for, the projected limited scale and nature of developments and because mitigation is possible which would be identified during activity specific assessment and permitting processes. Available mitigation measures include strict use of existing shipping and aircraft routes, and timing controls on temporary activities to avoid sensitive periods. It is therefore concluded that adverse effects from physical disturbance are not expected.

7.5 Implications for relevant European Sites

Physical disturbance e.g. from pipeline trenching, and placing facilities or deposits on the seabed were considered to have the potential to result in significant effects on SACs only if the Block was within or impinged on the site boundary. Therefore, as identified by the screening process (Appendix B), the potential for such effects only exists with respect to the Darwin Mounds cSAC and parts of Blocks 164/4, 164/5 and 165/1. Potential effects are assessed below.

Additionally, physical disturbance e.g. from the physical presence of infrastructure and survey or maintenance vessels were considered to have the potential to result in significant

effects on SPAs if the Blocks were within or immediately adjacent to sites designated for birds potentially vulnerable to physical disturbance, including common scoter and red-throated diver. The screening process did not identify the potential for any such effects; while several relevant SPAs contain red-throated diver as a qualifying feature and one with common scoter, these are all coastal and terrestrial sites designated for breeding birds rather than marine winter foraging grounds. Consequently, marine usage associated with these species and sites will be of relatively low density and largely restricted to adjacent coastal waters which are distant from the Blocks applied for.

Considering the locations of the Blocks and their anticipated work programmes described in Section 2.2, it is unlikely that any new terminals would be built as a result of developments following the licensing of these Blocks in the 25th Round. While new pipelines could conceivably come ashore at existing terminals, either through or near to coastal SACs and SPAs, there are well proven methods to prevent significant impacts. There is a legal framework, via the necessary pipeline consents, OPAR 2001 and EIA regulations, to ensure that correct project design and mitigation is employed so that significant effects on Natura 2000 sites are avoided. Consequently, the potential for such effects were not identified by the screening process.

Darwin Mounds cSAC

The southern parts of Blocks 164/4, 164/5 and 165/1 overlap the Darwin Mounds cSAC by approximately 80 km^2, 80 km^2 and 50 km^2 respectively, totalling approximately 210 km^2 and 15.25% of the total cSAC area. The site may be affected by a variety of activities occurring in the overlapping Blocks, including physical damage or disturbance from marine magnetotellurics (MMT) survey sea floor receiver array deployment, drilling rig and pipelay barge anchoring, facilities installation, and via deposits of rock and other particulates. Activities that might follow award of licences in the 25th Licensing Round would be subject to various regulatory controls, including EIA and AA and consents may not be granted. If permitted, mitigation would be required so that activities would not adversely affect the integrity of the site. Such mitigation methods would include detailed mapping of the seabed in the proposed area of operations to identify coral mounds and other sensitive seabed features (so they could be avoided), use of a dynamically positioned drill ship (as opposed to an anchored rig), zero discharge of mud and cuttings from the rig, and deviated drilling from outside the cSAC boundary etc. In view of the potential for mitigation it is concluded that significant effects on site integrity can be avoided.

7.6 Conclusions

Any potentially damaging activities that could follow the licensing of the 11 west of Orkney and WTR/DM area Blocks would be subject to statutory risk assessment, mitigation and permitting measures, which would include assessment of the potential effects on the integrity of Natura 2000 sites. It is unlikely that any new terminals would be built as a result of developments following 25th Round Licensing. While new pipelines could conceivably be constructed and come ashore at existing terminals, either through or near to coastal SACs and SPAs, there are well proven methods to prevent significant impacts. There is a legal framework, via e.g. EIA regulations and those implementing the Habitats Directive, to ensure that there are no adverse effects on Natura 2000 sites.

Taking into account the information presented above and in the Appendices, it is concluded that with mitigation, activities arising from the licensing of Blocks 164/4, 164/5, 165/1, 201/5, 202/24, 202/25, 202/29, 202/30, 203/16, 203/21 and 203/26 will not cause an adverse effect on the integrity of European Sites.

8 CONSIDERATION OF SITES AND POTENTIAL ACOUSTIC EFFECTS

8.1 Overview of effects of acoustic disturbance

Of all marine organisms, 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 large, gas filled organs 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. Otters in coastal habitats may also experience acoustic disturbance from seismic exploration or piling. However, they generally occupy shallow, inshore areas where the propagation of seismic noise is very limited.

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). While Atlantic salmon is the only qualifying fish species of relevant European Sites in the area (at a single SAC: River Borgie), numerous fish species present in the region provide important components of the diet of qualifying species of other relevant European Sites, such as grey (*Halichoerus grypus*) and common (*Phoca vitulina*) seals and several seabird species.

There are currently no UK Natura 2000 sites with mobile marine invertebrates as qualifying features. However, as with fish, invertebrates such as crabs and squid may form an important component of the diet of qualifying species of relevant European Sites, for example grey seal. The study of effects of seismic noise on invertebrates is limited, and it has been suggested that no reliable conclusions can be made that negative effects exist or not (Moriyasu *et al.* 2004). Recent studies into the effects of seismic exploration on crustaceans have shown no significant long term effects on physiology, behaviour or catch rates (Christian *et al*. 2003, DFO 2004, Parry & Gason 2006). Due to their well developed nervous system, cephalopods such as squid may be more sensitive to seismic noise than other invertebrates; however, evidence for effects of seismic noise on them is very limited (review in Moriyasu *et al*. 2004).

Direct effects on seabirds because of seismic exploration noise could occur through physical damage, or through disturbance of normal behaviour. Diving seabirds (e.g. auks) may be most at risk of 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 (penguins) 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 has 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 E&P related noise is insignificant. In specific cases of concern, mitigation through routeing restrictions would be implemented.

8.2 Noise sources and propagation

Compared to the noise derived from seismic surveys and piling, noise from other oil and gas activities is relatively minor; previous DECC SEAs have assessed noise in some detail, and the following discussion is focussed on seismic noise as the primary concern. The potential for significant effect is therefore largely related to the anticipated type, extent and duration of seismic survey associated with proposed licensing. The range over which noise propagates (and effects may result) varies with water depth, density stratification, substrate and other factors, and is therefore area-specific.

Seismic survey

With the exception of explosives and modern military sonar (and possibly windfarm monopile piling), airgun arrays used for seismic surveys are the highest energy man made sound sources in the sea; broadband peak-to-peak (p-p) source levels of 248-259dB re 1µPa are typical of large arrays (Richardson *et al*. 1995). Airgun noise is impulsive (i.e. non-continuous), with a typical duty cycle of 0.3% (i.e. one 25ms pulse every 10s) and slow rise time (in comparison to explosive noise). These characteristics complicate both the measurement of seismic noise "dose" and the assessment of biological effects (many of which have been studied in relation to continuous noise). Most of the energy produced by airguns is below 200Hz, although some high frequency noise may also be emitted (Goold 1996). Peak frequencies of seismic arrays are generally around 100Hz; source levels at higher frequencies are low relative to that at the peak frequency but are still loud in absolute terms and relative to background levels.

Current levels of seismic survey in the UKCS are around 20-30 surveys per year, which has been the case for the past few years. This has declined from 75 surveys in 1997 (DECC database of PON14 closeout submissions).

The offshore energy SEA process has reviewed general aspects of noise propagation. Most environmental assessments of noise disturbance in deeper water use simple spherical propagation models to predict sound pressure levels at varying distances from source. However, additional signal modification and attenuation may result from a combination of reflection from sub-surface geological boundaries, sub-surface transmission loss due to frictional dissipation and heat; and scattering within the water column and sub-surface due to reflection, refraction and diffraction in the propagating medium. In shallow water, reflection of high frequency signals from the seabed results in approximately cylindrical propagation and therefore higher received spectrum levels than for spherically propagated low frequency signals (which penetrate the seabed).

In general, as distance from the array increases, higher frequencies are attenuated more rapidly and beyond a few kilometres, the main contribution is in the 2kHz region. Finally beyond around 12km it will be the main low-frequency pulse of around 250Hz that has the main contribution. However, local propagation effects may have significant influence: for example frequency dependence due to destructive interference also forms an important part of the weakening of a noise signal. Simple models of geometric transmission loss may therefore be unreliable in relatively shallow water; in areas of complex seabed topography

and acoustic reflectivity; where vertical density stratification is present in deep water; and where the noise does not originate from a point source.

Other activities

Available measurements indicate that drilling activities produce mainly low-frequency continuous noise from several separate sources on the drilling unit (Richardson *et al*. 1995, Lawson *et al*. 2001). The primary sources of noise are various types of rotating machinery, with noise transmitted from a semi-submersible rig to the water column through submerged parts of the drilling unit hull, risers and mooring cables, and (to a much smaller extent) across the air-water interface. Noise transmission from jack-up rigs used in shallower water is less because of limited coupling with the water column. Under some circumstances, cavitation of thruster propellers is a further appreciable noise source, as may be the use of explosive cutting methods (e.g. for conductor removal).

Measured farfield sound pressure of around 170dB re 1µPa, in the frequency range 10-2000Hz (Davis *et al.* 1991) is probably typical of drilling from a semi-submersible rig and is of the same order and dominant frequency range as that from large merchant vessels (e.g. McCauley 1994). Drilling noise has also been monitored west of Shetland, in the vicinity of the Foinaven and Schiehallion developments (Swift & Thompson 2000). High and variable levels of noise were initially believed to result from drilling related activity on two semi-submersible rigs operating in the area. However, subsequent analysis found more direct correlation between the use of thrusters and anchor handlers, during rig moves, and high levels of noise (Swift & Thompson 2000). Further measurements of drilling and pipelay noise in the North Sea have been sponsored by the industry (Nedwell & Needham 2001, Nedwell *et al*. 2001, Nedwell *et al*. 2002). Drilling duration may range from a few weeks for an exploration well, to years in the case of a large development programme.

Pipelay operations will result mainly in continuous noise (associated with rotating machinery), with relatively little impulse or percussive noise in comparison to many other marine construction activities. The overall source levels resulting from pipelay operations on the UKCS have not been measured, although near-field cumulative sound levels associated with pipelay for the Clair field development were predicted to be a maximum of 177dB (Lawson *et al*. 2001), with a duration of weeks or months.

Although there is little published data, noise emission from production platforms is thought to be qualitatively similar to that from ships, and is produced mainly by rotating machinery (turbines, generators, compressors) (Richardson *et al*. 1995).

A further source of noise associated with all stages of the offshore oil industry is helicopter overflights. There is relatively little quantitative information on the transmission of helicopter airborne noise to the marine environment (Richardson *et al*. 1995). Measurements of an airsea rescue helicopter over the Shannon estuary (Berrow *et al*. 2002) indicated that due to the large impedance mismatch when sound travels from air to water, the penetration of airborne sound energy from the rotor blades was largely reflected from the surface of the water with only a small fraction of the sound energy coupled into the water.

8.2.1 Effects thresholds

Richardson *et al.* (1995) defined a series of zones of noise influence on marine mammals, which have been generally adopted by SEAs and EAs undertaken in relation to previous Licensing Rounds. Similarly, data on marine mammal responses have been exhaustively reviewed (e.g. Richardson *et al*. 1995, Gordon *et al*. 1998, Lawson *et al*. 2001, Simmonds *et al*. 2003, Nowacek *et al*. 2007, Weilgart 2007, Southall *et al*. 2007). Four zones are

recognised which will generally occur at increasing sound level: (1) the zone of audibility; (2) zone of responsiveness; (3) zone of masking; (4) zone of hearing loss, discomfort or injury. Potential acute effects include physical damage, noise-induced hearing loss (temporary and permanent threshold shifts, TTS and PTS respectively) and short-term behavioural responses. Postulated chronic effects (for which evidence is almost entirely absent) include long term behavioural responses, exclusion, and indirect effects. The most likely physical/physiological effects are generally considered to be shifts in hearing thresholds and auditory damage.

Injury and behavioural criteria

The Offshore Energy SEA (DECC 2009) reviewed recent data and recommendations for injury and behavioural criteria for noise assessment in marine mammals. The difficult issue of determining when noise causes biologically significant effects in marine mammals has been addressed by NRC (2005). This clarifies the term biologically significant in the context of the US Marine Mammal Protection Act (MMPA), which considers two levels of harassment – level A and level B harassment; in turn specified by National Marine Fisheries Service (NMFS) criteria as noise pressure thresholds of 180 and 160 dB re 1 µPa rms respectively. These values were derived by the High Energy Seismic Survey (HESS) team panel of experts convened in 1999 to assess noise exposure criteria for marine mammals exposed to seismic pulses. The consensus was that, given the best available data at that time, exposure to airgun pulses with received levels above 180dB re 1 µPa (averaged over the pulse duration) was "likely to have the potential to cause serious behavioural, physiological, and hearing effects." The panel noted the potential for ± 10dB variability around the 180dB re 1 µPa level, depending on species, and that more information was needed.

The NMFS has continued to use a "do not exceed" exposure criterion of 180dB re 1 µPa for mysticetes and (recently) all odontocetes exposed to sequences of pulsed sounds, and a 190dB re 1 µPa criterion for pinnipeds exposed to such sounds. Behavioural disturbance criteria for pulsed sounds have typically been set at an SPL value of 160dB re 1 µPa, based mainly on the earlier observations of mysticetes reacting to airgun pulses. However, the relevance of the 160dB re 1 µPa disturbance criterion for odontocetes and pinnipeds exposed to pulsed sounds is not at all well-established. Although these criteria have been applied in various regulatory actions (principally in the U.S.) for more than a decade, they remain controversial, have not been applied consistently in the U.S., and have not been widely accepted elsewhere (Southall *et al*. 2007). Southall *et al*. (2007) have recently proposed injury criteria composed both of unweighted peak pressures and M-weighted sound exposure levels which are an expression for the total energy of a sound wave. The M-weighted function also takes the known or derived species-specific audiogram into account. For three functional hearing categories of cetaceans, proposed injury criteria are an unweighted 230dB re 1µPa p-p for all types of sounds and an M-weighted sound exposure level of 198 or 215dB re 1 $\mu Pa^2 \cdot s$ for pulsed and non-pulsed sounds respectively. For pinnipeds, the respective criteria are 218dB 1µPa p-p for all types of sound and 186 (pulsed) or 203 (non-pulse) dB re 1 $\mu Pa^2 \cdot s$ (M-weighted). These proposals are based on the level at which a single exposure is estimated to cause onset of permanent hearing loss (PTS), by extrapolating from available data for TTS.

Southall *et al*. (2007) concluded that developing behavioural criteria was challenging, in part due to the difficulty in distinguishing a significant behavioural response from an insignificant, momentary alteration in behaviour. Consequently, they recommended that onset of significant behavioural disturbance resulting from a single pulse is taken to occur at the lowest level of noise exposure that has a measurable transient effect on hearing (i.e. TTS-onset). These criteria for single pulses are an unweighted 224dB re 1µPa p-p and an M-

weighted sound exposure level of 183dB re 1 $\mu Pa^2 \cdot s$ for three functional hearing categories of cetaceans, and 212dB re 1μPa (p-p) and 171dB re 1 $\mu Pa^2 \cdot s$ (M-weighted) for pinnipeds.

For multiple pulse and non-pulse (i.e. continuous) sources, they were unable to derive explicit and broadly applicable numerical threshold values for delineating behavioural disturbance. A scoring paradigm was used to numerically rank, in terms of severity, behavioural responses observed in either field or laboratory conditions. However, due to various statistical and methodological problems, much of this data was not considered to provide sufficient scientific credence for establishment of exposure criteria. Southall *et al*. (2007) noted the importance of contextual variables in determining behavioural response; together with the presence or absence of acoustic similarities between the anthropogenic sound and biologically relevant natural signals (e.g. calls of conspecifics, predators, prey). They suggest that the concept of a context-based approach to deriving noise exposure criteria for behavioural responses will be necessary.

Based on NMFS and Southall *et al*.'s (2007) proposed criteria relating to pinnipeds and single pulsed sounds from a typical seismic survey, the range exceeding the injury criteria (onset of PTS) would extend to approximately 9m (p-p) from source, and for significant behavioural disturbance (onset of TTS) approximately 22m (p-p) from source.

Seismic array / propagation characteristics	
Source Level	250 dB
array loss (horizontal directivity)	18 dB
propagation loss factor (logarithmic)	15 dB
Effect threshold	
Southall criteria	
single pulse PTS onset, pinnipeds	218 dB
single pulse TTS onset, pinnipeds	212 dB
NMFS A (18dB corr to p-p)	198 dB
NMFS B (18dB corr to p-p)	178 dB
Lucke (porpoise TTS)	184 dB
Required transmission loss (TL)[1]	
PTS single pulse range TL	14 dB
TTS single pulse range TL	20 dB
NMFS A (18dB corr to p-p)	34 dB
NMFS B (18dB corr to p-p)	54 dB
Lucke (porpoise TTS)	48 dB
Required range[2]	
PTS single pulse range	9 m
TTS single pulse range	22 m
NMFS A (18dB corr to p-p)	185 m
NMFS B (18dB corr to p-p)	4.0 km
Lucke (porpoise TTS)	1.6 km

1 TL = SL-array loss-effect threshold
2 Range = 10^(TL/propagation loss factor)

These ranges represent a tiny proportion of the marine areas used by seals associated with European Sites to the west of Scotland; therefore, disturbance effects beyond site boundaries are not expected to have consequent effects on site integrity.

Popper et al. (2006) suggested interim criteria for injury of fish exposed to pile driving operations, although note that the majority of the evidence base for such criteria is derived from studies of seismic and explosive noise sources. A peak sound pressure level of 208dB re 1µPa for single pulses is proposed. This is supported by the findings of Popper *et al*. (2005) who showed that TTS onset (physiological fatigue and not damage) in three species of fish exposed to seismic air-gun pulses occurred within the range of 205-210dB re 1 µPa (p-p). Popper *et al*. (2006) considered available data as too sparse to set clear-cut science-based criteria for behavioural disturbance of fish or auditory masking from pile driving.

Seismic exploration noise could potentially result in direct effects on seabirds through physical damage, or through disturbance of normal behaviour. Diving seabirds (e.g. auks) may be most at risk of physical damage. 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 little penguins would be high, hence only at short ranges would penguins be adversely affected. Mortality of seabirds has not been observed during extensive seismic operations in the North Sea and elsewhere. A study of seabird abundance in Hudson Strait (Atlantic Canada) during seismic surveys over three years (Stemp 1985) compared periods of shooting and nonshooting, found no significant difference in the abundance of fulmar, kittiwake and thickbilled murre (Brünnich's guillemot). Lacroix *et al*. (2003) in a study of long tailed ducks in the Beaufort Sea, found no difference in indices of site fidelity or diving intensity between the seismic area and two control areas although they could not discount subtle effects. It is therefore considered that offshore seismic noise will not result in significant injury or behavioural disturbance to seabirds in the general area of a survey.

8.3 Implications for relevant European Sites

As discussed above, it is considered that marine mammals and migratory fish are the only qualifying species which may potentially be affected (in terms of conservation status) by acoustic disturbance. In addition, following consultation feedback, site specific consideration of the Faray and Holm of Faray SAC and Sule Skerry and Sule Stack SPA is given below. The screening process (Appendix B) identified the potential for acoustic disturbance of otters and seals at a number of island sites; in addition, there was considered to be potential for the disturbance of migratory salmon at a single site (River Borgie SAC).

Yell Sound Coast SAC, Mousa SAC, Sanday SAC, Faray and Holm of Faray, SAC North Rona SAC, Monach Islands SAC, Ascrib, Isay and Dunvegan SAC

The Yell Sound area has the highest density of otters in Shetland and the site is believed to support over 2% of the population of Great Britain. Distinct from their mainland counterparts, Shetland otters are the most intensely studied and possibly densest populations in Europe. Adjacent marine areas have extensive algal beds which are used for foraging.

Common seal *Phoca vitulina* are a non-primary feature of four sites. Yell Sound SAC supports important numbers of common seal (over 1% UK population), and represent the most northerly site selected for this feature in the UK. Mousa SAC also supports one of the largest groups of common seal in Shetland. The large rocky tidal pools on the island are of particular importance, as they are frequently used by the seals for pupping, breeding and

moulting, and provide shelter from the exposed conditions on the open coast. The site supports just over 1% of the UK population. The common seal colony at Sanday in Orkney is the largest at any discrete site in Scotland with the breeding groups representing over 4% of the UK population. The Faray and Holm of Faray SAC consists of two uninhabited islands with the second-largest grey seal breeding colony in the UK which contributes around 9% of annual UK pup production. Ascrib, Isay and Dunvegan SAC comprises a complex of skerries, islets, undisturbed mainland shores and offshore islands in northwest Skye consistently supporting a discrete colonies of common seals with around 2% of the UK population.

North Rona is a remote and very exposed island in the North Atlantic off the north-west tip of Scotland. Grey seal are found over much of the island and use many of the submerged sea caves that are found around the coast. North Rona supports the third-largest breeding colony in the UK, representing some 5% of annual UK pup production. The seals forage widely throughout waters adjacent to the SAC and beyond. The Monach Islands, off the Outer Hebrides, offer a wide area of largely undisturbed habitat for breeding grey seal *Halichoerus grypus*, and hold the largest breeding colony in the UK, contributing over 20% of annual UK pup production.

Simple calculations of sound propagation can be made to estimate the likely maximum received sound levels at the boundaries of relevant European Sites should a typical seismic survey occur in any one of the Blocks applied for; the results of these are presented in Table 8.1. Most environmental assessments of noise disturbance use simple spherical propagation models of the form SPL = SL – 20log(R), where SL = source level, R = source-receiver range, to predict sound pressure levels (SPL) at varying distances from source. Cylindrical spreading, SPL = SL – 10log(R), is usually assumed in shallow water, depth < R. However, several workers have measured or modelled additional signal modification and attenuation due to a combination of reflection from sub-surface geological boundaries, sub-surface transmission loss due to frictional dissipation and heat; and scattering within the water column and sub-surface due to reflection, refraction and diffraction in the propagating medium (see SEA 4 Environmental Report). In shallow water, reflection of high frequency signals from the seabed results in approximately cylindrical propagation and therefore higher received spectrum levels than for spherically propagated low frequency signals (which penetrate the seabed). Attenuation of signal with distance is frequency dependent, with stronger attenuation of higher frequencies with increasing distance from the source. Frequency dependence due to destructive interference also forms an important part of the weakening of a noise signal.

Propagation has been measured for sounds from pile-driving as well as sounds from operating wind turbines (Madsen *et al*. 2006. For the transient impact sounds from pile-driving, the available data suggest that transmission losses are close to spherical spreading (in the range 11log(R) to 35log(R) up to ranges of more than 1km. Similarly, quantitative modelling of seismic noise propagation in Queen Charlotte Basin, Canada (MacGillivray & Chapman 2005) predicted that received noise levels would be lowest in those areas of the basin with shallow bathymetry due to scattering and absorption of sound at the seabed.

In the case of the nearest site in which marine mammals are qualifying features to a proposed block, Sanday SAC to Block 203/16, the minimum direct linear range from the SAC boundary to the Block is approximately 69km, giving a propagation loss (assuming 15logR) of around 73dB, or a received sound level of 157dB re 1μPa p-p for a typical seismic survey. This level is considerably lower than the injury criteria proposed by Southall *et al.* (2007) in pinnipeds for both pulsed and non-pulsed sounds, and also below those

proposed for the onset of TTS (postulated as significant behavioural disturbance) for pulsed sounds.

Table 8.1 - Estimated received sound levels in relevant European Sites associated with a typical seismic survey

Site	Closest Block	Minimum distance (km)	Received sound level (dB re 1μPa peak-to-peak)
Mousa SAC	203/16	154	152
Sanday SAC	203/16	69	157
Ascrib, Isay and Dunvegan SAC	201/5 & 202/29	200	150
North Rona SAC	202/24 & 202/29	80	156
Monach Islands SAC	164/4	256	149
River Borgie SAC	201/5	34	162

Notes: Assumes a source level of 250dB re 1μPa peak-to-peak, a correction factor of -20dB to compensate for horizontal array effects, and a propagation loss of 15log(R). Figures are rounded to the nearest whole number. Yell Sound SAC has been excluded as noise propagation into the site is unlikely given the orientation of the mouth of Yell Sound

Seismic survey occurring in licence Blocks west of Orkney and in the WTR/DM area will be audible to seals over a large area of the continental shelf and slope north and west of Scotland, an area of moderate-low marine usage by foraging common and grey seals associated with breeding sites at coastal SACs (Sharples *et al*. 2008, Murphy *et al*. 2008). Audibility to marine mammals within the SACs in which they are qualifying features is considered likely. The exact effects which this may have are unknown, although available evidence suggests that significant effects at a population level are unlikely.

Noise levels suggested to cause auditory damage in phocids are rapidly attenuated with distance from source, and would therefore not propagate into the SAC and have very limited potential for spatial overlap with seals foraging beyond the boundary of the SAC. Furthermore, distances over which hearing damage may occur are well within the effective range of the mitigation measures which would be employed to minimise disturbance to marine mammals. Additionally, any future seismic survey plans would be subject to a source- and site-specific assessment of the potential for adverse effects, including AA.

If significant ecological effects on prey species were to occur, even at considerable distances from breeding and haul-out sites at coastal SACs, these may influence the breeding populations of the sites. However, noise levels suggested to cause injury to fish (the primary prey species of seals) would not extend beyond a few tens of metres around the noise source. The range over which non-injurious disturbance effects on fish might occur is not possible to define, although available evidence suggests that the extent of any such disturbance of prey species is highly unlikely to have significant effects on relevant qualifying species at a population level.

Noise levels associated with other activities potentially resulting from the 25th Licensing Round such as a drilling, vessel movements, pipe-laying operations, are of a considerably lower magnitude than those resulting from seismic survey, and are not expected to have significant effects on relevant qualifying species at a population level.

River Borgie SAC

The River Borgie SAC supports Atlantic salmon *Salmo salar* as Annex II species present as a qualifying feature, but not a primary reason for site selection. The potential for impact can

be mitigated through timing of seismic survey to avoid the period of salmon entry into the rivers (typically spring and early summer) and consequently significant effects on this qualifying feature can be avoided.

Sule Skerry and Sule Stack SPA

One of the Blocks applied for in the west Orkney group (202/29) overlaps with the site boundary (see Map A.1). The site is designated for Article 4.1 species (breeding storm-petrel and Leach's storm-petrel) and Article 4.2 species (breeding gannet, puffin and shag) and the site regularly supports a breeding assemblage of 100,000 individual seabirds (the status of all the species are favourable maintained - see Appendix C). The site conservation objectives include avoidance of significant disturbance to the qualifying species and deterioration of the habitats. For the species for which any evidence is available, the indications are that significant effects from seismic or other noise are unlikely. However, the mandatory Habitats Regulations Assessment procedures will allow further consideration of the nature, timing and location of any planned activities and the identification of mitigation measures deemed necessary (including conditions attached to consents/permits, for example, avoidance of exploration activities during the breeding season, or potentially consent/permit refusal).

8.4 Regulation and mitigation

Both planning and operational controls cover acoustic disturbance resulting from activities on the UKCS, specifically including geophysical surveying and pile-driving. Application for consent to conduct seismic and other geophysical surveys is made using *Petroleum Operations Notice No 14* (PON14) supported by an Environmental Narrative to enable an accurate assessment of the environmental effects of the survey. Consultations with Government Departments and other interested parties are conducted prior to issuing consent, and JNCC may request additional risk assessment, specify timing or other constraints, or advise against consent. Any proposed activity with a potentially significant acoustic impact within a designated SAC or SPA would also be subject to the requirement for Appropriate Assessment.

The major operational control and mitigation over seismic surveys in the UK are through JNCC's *Guidelines for minimising the risk of disturbance and injury to marine mammals from seismic surveys* (June 2009 revision to reflect the *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007* as amended). It is a condition of consents issued under Regulation 4 of the *Petroleum Activities (Conservation of Habitats) Regulations 2001* (& 2007 Amendments) for oil and gas related seismic surveys that the JNCC Seismic Guidelines are followed.

The guidelines require visual monitoring of the area by a dedicated Marine Mammal Observer (MMO) prior to seismic testing to determine if cetaceans are in the vicinity, and a slow and progressive build-up of sound to enable animals to move away from the source. Passive Acoustic Monitoring (PAM) may also be required. Seismic operators are required, as part of the application process, to 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). This assessment should consider all operational activities including shooting during hours of darkness or in poor visibility.

In their latest guidelines, JNCC (2009) advise that operators adopt mitigation measures which are appropriate to minimise the risk of an injury or disturbance offence[5] and stipulate, whenever possible, the implementation of several best practice measure, including:

- only commence seismic activities during the hours of daylight when visual mitigation by MMOs is possible.
- only commence seismic activities during the hours of darkness, or low visibility (including unsuitable sea state for visual mitigation), if an effective PAM system is used. In areas of particular importance for marine mammals, a PAM system should be used during day, night and other poor visibility seismic shooting.
- plan surveys so that the timing will reduce the likelihood of encounters with marine mammals.
- provide trained MMOs to implement the JNCC guidelines.
- use the lowest practicable power levels to achieve the geophysical objectives of the survey.
- seek methods to reduce and/or baffle unnecessary high frequency noise produced by airguns (along with other acoustic energy sources).

8.5 Conclusions

As all blocks under consideration are at least several kilometres from the boundaries of SPAs, direct significant effects on SPAs were not considered possible. Indirect mechanisms of effect, for example through disturbance of prey species, were also considered with the conclusion that these will not have an adverse effect on integrity (i.e. on population viability of qualifying bird species).

Significant effects arising from acoustic disturbance were only considered possible for SACs with marine mammals and fish as a primary or secondary feature. Although seismic survey, drilling and other oil industry noise is detectable by marine mammals, waterbirds and their prey, there is no evidence that such noise presents a risk to the viability of populations in UK waters and specifically not within designated Natura 2000 sites. This would require direct mortality, behavioural response with implications for reproductive success (e.g. disturbance at fixed breeding locations) or reduced long-term ecological viability (e.g. sustained displacement from foraging grounds). In the localised areas of Natura 2000 sites designated for marine mammals, acoustic disturbance from seismic survey activity resulting from proposed licensing would be intermittent and there is no evidence that cumulative effects of previous survey effort have been adverse. Despite considerable scientific effort, no causal link, or reasonable concern in relation to population viability has been found.

Modelling of seismic noise propagation for licensed Blocks west of Orkney and in the WTR/DM area has generally concluded that effects on the relevant SACs will not be significant. In the case of the Blocks under consideration here, calculations considering the direct linear range to the SAC boundaries, and important areas beyond SAC boundaries used by qualifying features, and the source level of a typical seismic survey suggest that received noise levels within all these areas will fall below relevant effects criteria as defined by Southall *et al*. (2007) and the NMFS.

Taking into account the information presented above and in the Appendices, it is concluded that activities which could arise from the proposed licensing of Blocks 164/4, 164/5, 165/1, 201/5, 202/24, 202/25, 202/29, 202/30, 203/16, 203/21 and 203/26 will not cause an adverse effect on the integrity of the European Sites.

[5] Defined under Regulation 39 1(a) and 1(b) (respectively) of the *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007* (as amended)

9 IN-COMBINATION EFFECTS

Seismic survey and other noise producing activities that might follow the proposed licensing are anticipated to be widely separated in space and time. Therefore, any acoustic disturbance to marine mammals causing displacement from foraging areas will be short-term and infrequent. SMRU (2007) note that "The effects of repeated surveys are not known, but insignificant transient effects may become important if potentially disturbing activities are repeated and/or intensified." As noted in Section 8.2, the number of seismic surveys is substantially less than historic peaks and as a result significant in-combination effects with oil and gas activities in existing licensed blocks are not foreseen.

Other noise producing activities which are likely to occur west of Orkney and in the WTR/DM area include vessel movements (commercial shipping and fishing) those associated with the development of marine renewable energy. There are various proposals for wind energy developments in Scottish territorial waters and the Crown Estate have identified an area in the outer Moray Firth beyond 12nm of the coast as a potential area for offshore wind energy development. Any pile-driving or other construction noise associated with renewable energy development in the outer Moray Firth has the potential for effects on grey and common seals associated with European Sites in Orkney. Consenting of any development within these areas will also be subject to the conclusions of an SEA, project-specific EIA and Habitats Regulations Assessment.

The Pentland Firth and waters surrounding Orkney are of considerable interest for the development of wave and tidal energy devices. The Crown Estate have identified Scottish territorial waters along the north coast of mainland Scotland and around Orkney as a potential area for wave and tidal energy development and announced plans to hold a leasing competition in the Pentland Firth strategic area in September 2008. The award of leases in this area is imminent. Consenting of any such developments will be subject to the conclusions of project-specific EIA and Habitats Regulations Assessments.

While the operation, maintenance and decommissioning of marine renewable energy developments will introduce noise into the marine environment, this will typically be of low intensity. The greatest noise levels arise during the construction phase, and it is these which are have the greatest potential for acoustic disturbance effects (see Faber Maunsell & Metoc 2007, DECC 2009). Pile-driving of mono-pile foundations is the principal source of construction noise, which will be qualitatively similar to pile-driving noise resulting from harbour works, bridge construction and oil and gas platform installation. While considerable uncertainty exists over the likely nature and installation method of foundations for future wave and tidal devices, a precautionary approach to assessment dictates the assumption that some level of pile-driving will occur, at least for tidal energy developments. Mono-pile foundations are the most commonly used for offshore windfarm developments at present, and are likely to be widely utilised in initial Scottish territorial water developments.

In relation to offshore pile-driving, standard conditions on consents for Round 2 offshore wind farms include various protocols to minimise the potential for acoustic disturbance of marine life, including the use of soft start, MMOs and PAM. For future developments, additional measures are likely to be required in areas where EIA suggests that high cetacean densities or site fidelity may occur; these may include technical measures such as pile sleeves (see Nehls *et al*. 2007). The "Statutory nature conservation agency protocol for minimising the risk of disturbance and injury to marine mammals from piling noise" (JNCC 2009) outlines a protocol for the mitigation of potential underwater noise impacts arising from pile driving during offshore wind farm construction. SNH may in the future produce similar guidance in respect of Scottish territorial waters.

In addition to those activities which may follow oil and gas licensing and future marine renewable energy development, there are a variety of other existing (e.g. oil and gas production, wind turbine deployments, fishing (particularly bottom trawling), shipping, military exercise areas, wildlife watching cruises) and planned (e.g. oil and gas exploration and production) noise-producing activities in overlapping or adjacent areas. Despite this, DECC is not aware of any projects or activities which are likely to cause cumulative or synergistic effects that when taken in-combination with the activities discussed above would adversely affect the integrity of the relevant European Sites. This is due to the presence of effective regulatory mechanisms in place to ensure that operators, DECC and other relevant consenting authorities take such considerations into account during activity permitting. These mechanisms generally allow for public participation in the process, and this will be strengthened by regulations amending the offshore EIA regime which are due to come into force later this year. In respect of oil and gas activities and other developments with the potential to affect Natura 2000 sites, these mechanisms also include project specific Habitats Regulations Assessment.

However, the Offshore Energy SEA (DECC 2009) recommended that operational criteria should be established to limit the cumulative pulse noise "dose" (e.g. resulting from seismic survey and offshore pile-driving) within specified areas, which included: north and east of Orkney (grey and harbour seals); and, the Moray Firth and coastal waters south to the Forth (bottlenose dolphin) including Smith Bank (grey and harbour seals) and the inner Firths (harbour seal).

Potential incremental, cumulative, synergistic and secondary effects from a range of operations, discharges, emissions (including noise), and accidents were considered in the Offshore Energy SEA (DECC 2009; see also OSPAR 2000). Available evidence for the region indicates that past oil and gas activity and discharges has not lead to adverse impacts on the integrity of European sites in the area. The current controls on terrestrial and marine industrial activities, including oil and gas operations that could follow licensing, can be expected to prevent significant in-combination effects affecting relevant European sites.

It is concluded that the in-combination of effects from activities arising from the licensing of Blocks on the Wyville Thomson Ridge and to the west of Orkney with those from existing and planned activities in the area will not cause an adverse effect on the integrity of the relevant European Sites.

10 CONSIDERATION OF SITES NOT YET SUBMITTED TO THE EC

The Wyville Thomson Ridge pSAC covers some 1740km^2 and includes extensive areas of stony reef interspersed with gravel areas and bedrock reef along the flanks. The rock and stony reef areas support diverse biological communities representative of hard substratum in deep water, and include abundant sponges, hard and soft corals, featherstars and brittlestars. Consideration of vulnerability of these features to oil spills, physical damage and contamination is given below.

Several activities associated with exploration and production can lead to physical disturbance of seabed habitats, with consequent effects on benthic communities. The main sources of disturbance are the anchoring of semi-submersible rigs, wellhead placement and recovery, production facility installation, pipeline, flowline and umbilical installation and trenching and the decommissioning of infrastructure.

Activities which may physically damage the seabed such as rig anchoring and installation of production facilities would be subject to detailed assessment informed by detailed topographic and other survey prior to activity consenting so that appropriate mitigation can be identified and agreed. This may include no anchoring for example by use of a dynamically positioned rig and construction vessels, installation site selection and pipeline routeing to avoid sensitive features. With such mitigation residual physical impact is expected to be minor and therefore not to affect the integrity of the site.

Current rules effectively mean that only water based drill muds (WBM) would be discharged from drilling operations either on rock cuttings or as excess mud. Around 95% of the constituents of a typical WBM are naturally-occurring (and defined by OSPAR as posing little or no risk to the environment) while remaining chemicals would have low toxicity and bioaccumulation potential. There are strict regulatory controls over the use and discharge of offshore chemicals and toxic or enrichment effects are not envisaged. Dispersion of mud and cuttings is influenced by various factors. The range of cuttings particle size results in a significant variation in settling velocity, and a consequent gradient in the size distribution of settled cuttings, with coarser material closer to the discharge location and finer material very widely dispersed away from the location. Extensive monitoring of the ecological effects of discharged WBM cuttings has been carried out in the North and Irish Seas (and internationally) and the consensus view is that any effects are subtle, very localised and transient. In view of the deep water and energetic hydrography of the area the site is believed to be tolerant of discharges of drilling solids both at the seabed from the surface hole section(s) and from the drilling rig. Sinks, that is particular areas where such materials could accumulate, have not been identified in the area.

Oil spills can have potentially adverse effects on the marine environment, and are controlled in direct proportion to this by a legal framework that minimises their occurrence, provides for contingency planning, response and clean up, and which enables prosecutions. It is not credible to conclude that in spite of the regulatory controls, an oil spill will never occur as a result of 25th Round licensing. However, the potential risks of oil spills are mitigated over the Wyville Thomson Ridge by the deep water (400m and deeper) overlying the features of interest and by the distance offshore which allows for natural dispersion before a slick would approach European Sites on the coast. Taking into account the risks, controls and mitigating factors, it is concluded that oil spills arising from the proposed 25th Licence Round will not result in an adverse effect on the integrity of this site.

In conclusion, planning and environmental permitting arrangements covering exploration, drilling, pipeline route and development provide effective mechanisms to ensure that these activities do not adversely affect the integrity of the Wyville Thomson Ridge pSAC.

11 OVERALL CONCLUSION

Taking account of all the matters discussed, the Secretary of State is able to grant consent to the plan/programme (as defined) under the Habitats Directive and award the licences covering Blocks 164/4, 164/5, 165/1, 174/28, 174/29, 174/30, 175/26, 201/5, 202/24, 202/25, 202/29, 202/30, 203/16, 203/21 and 203/26 (the 4 Blocks screened out in Section 4 and the 11 Blocks subject to AA). This is because there is certainty, within the meaning of the ECJ Judgment in the ***Waddenzee*** case, that the action will not adversely affect the integrity of relevant European Sites, taking account of the mitigation measures that can be imposed through existing permitting mechanisms on the planning and conduct of activities.

These mitigation measures are incorporated in respect of habitat, diadromous fish, bird and marine mammal interest features through the range of legislation and guidance (see https://www.og.decc.gov.uk/environment/environ_leg_index.htm and https://www.og.decc.gov.uk/regulation/pons/index.htm) which apply to developer activities which could follow plan adoption. These mitigation measures include, where necessary, project-specific Appropriate Assessments based on detailed project proposals which would be undertaken by the competent authority before the granting of a permit/consent. The competent authority needs to be satisfied that the proposed activity will not result in adverse effects on integrity of European/Ramsar sites.

Even where a site/interest feature has been screened out in the plan level assessment, or where a conclusion of no adverse effect on integrity has been reached at plan level, project level assessment will be necessary if, for example, new European/Ramsar sites have been designated after the plan level assessment; new information emerges about the nature and sensitivities of interest features within sites, new information emerges about effects including in-combination effects; or if plan level assumptions have not been met at the project level.

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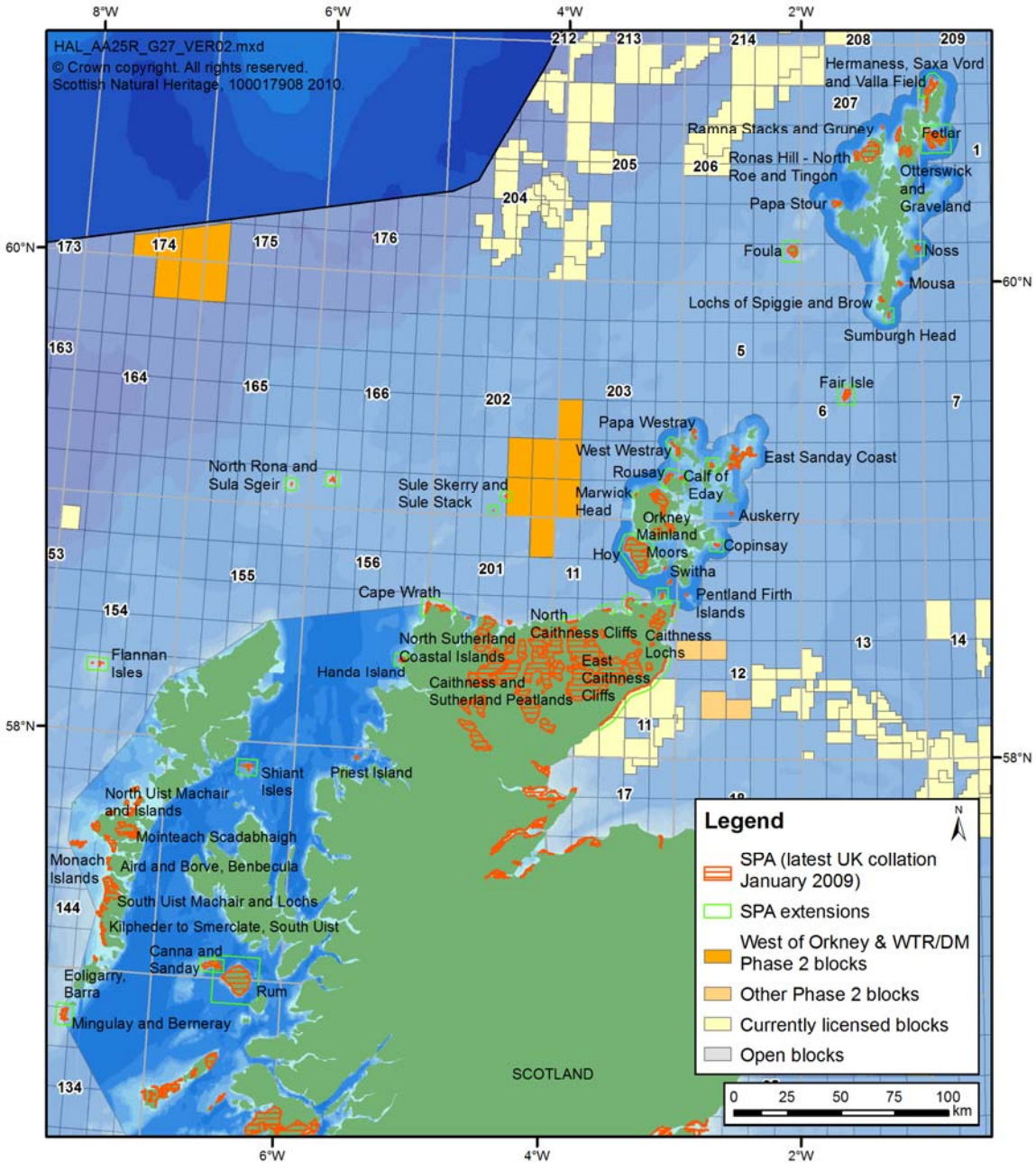
APPENDIX A - THE SITES

The migratory and/or Annex I bird species for which SPAs are selected in the UK are listed in Box A.1, and the relevant SPAs their qualifying features are given in Table A.1.

Abbreviations for the Annex 1 habitats used in SAC site summaries (Tables A.2, A.3 and A.4) are listed in Box A.2.

A1 Coastal and Marine Special Protection Areas

Map A.1 - Coastal and marine Special Protection Areas



Note: Proposed SPA marine extensions are also indicated.

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

Divers and grebes
Red-throated diver *Gavia stellata*
Black-throated diver *Gavia arctica*
Little grebe *Tachybaptus ruficollis*
Great crested grebe *Podiceps cristatus*
Slavonian grebe *Podiceps auritus*

Seabirds
Fulmar *Fulmarus glacialis*
Manx shearwater *Puffinus puffinus*
Storm petrel *Hydrobates pelagicus*
Leach's petrel *Oceanodroma leucorhoa*
Gannet *Morus bassanus*
Cormorant *Phalacrocorax carbo carbo*
Shag *Phalacrocorax aristotelis*
Guillemot *Uria aalge*
Razorbill *Alca torda*
Puffin *Fratercula arctica*

Gulls, terns and skuas
Arctic skua *Stercorarius parasiticus*
Great skua *Catharacta skua*
Mediterranean gull *Larus melanocephalus*
Black-headed gull *Larus ridibundus*
Common gull *Larus canus*
Lesser black-backed gull *Larus fuscus*
Herring gull *Larus argentatus*
Great black-backed gull *Larus marinus*
Kittiwake *Rissa tridactyla*
Sandwich tern *Sterna sandvicensis*
Roseate tern *Sterna dougallii*
Common tern *Sterna hirundo*
Arctic tern *Sterna paradisaea*
Little tern *Sterna albifrons*

Crakes and rails
Spotted crake *Porzana porzana*
Corncrake *Crex crex*
Coot *Fulica atra*

Birds of prey and owls
Honey buzzard *Pernis apivorus*
Red kite *Milvus milvus*
Marsh harrier *Circus aeruginosus*
Hen harrier *Circus cyaneus*
Golden eagle *Aquila chrysaetos*
Osprey *Pandion haliaetus*
Merlin *Falco columbarius*
Peregrine *Falco peregrinus*
Short-eared owl *Asio flammeus*

Other bird species
Capercaillie *Tetrao urogallus*
Nightjar *Caprimulgus europaeus*
Woodlark *Lullula arborea*
Fair Isle wren *Troglodytes troglodytes fridariensis*
Aquatic warbler *Acrocephalus paludicola*
Dartford warbler *Sylvia undata*
Chough *Pyrrhocorax pyrrhocorax*
Scottish crossbill *Loxia scotica*

Waders
Oystercatcher *Haematopus ostralegus*
Avocet *Recurvirostra avosetta*
Stone Curlew *Burhinus oedicnemus*
Ringed Plover *Charadrius hiaticula*
Dotterel *Charadrius morinellus*
Golden Plover *Pluvialis apricaria*
Grey Plover *Pluvialis squatarola*
Lapwing *Vanellus vanellus*
Knot *Calidris canutus*
Sanderling *Calidris alba*
Purple Sandpiper *Calidris maritima*
Dunlin *Calidris alpina alpina*
Ruff *Philomachus pugnax*
Snipe *Gallinago gallinago*
Black-tailed Godwit *Limosa limosa* (breeding)
Black-tailed Godwit *Limosa limosa islandica* (non-breeding)
Bar-tailed Godwit *Limosa lapponica*
Whimbrel *Numenius phaeopus*
Curlew *Numenius arquata*
Redshank *Tringa totanus*
Greenshank *Tringa nebularia*
Wood Sandpiper *Tringa glareola*
Turnstone *Arenaria interpres*
Red-necked Phalarope *Phalaropus lobatus*

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

Table A.1 - Coastal and marine SPAs and their Qualifying Features

Site Name	Area (ha)[6]	Article 4.1 Species	Article 4.2 Migratory species	Article 4.2 Assemblages[7]
SHETLAND				
Sumburgh Head SPA	39.04 + 2km extension	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	1323.31 + 2km extension	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: Merlin Red-throated diver	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	1037.3 + 2km extension	Breeding: Red-throated diver	Breeding: Gannet Great skua Puffin	Breeding: Seabirds
Fetlar SPA	2594.91 + 2km extension	Breeding: Arctic tern Red-necked phalarope	Breeding: Dunlin Great skua Whimbrel	Breeding: Seabirds
Noss SPA	343.82 + 2km extension	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	561.27 + 2km extension	Breeding: Arctic tern Fair Isle wren	Breeding: Guillemot	Breeding: Seabird
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
Orkney Mainland Moors SPA	4444.35	Breeding: Hen harrier Red-throated diver Short-eared owl Over winter: Hen harrier	N/A	N/A
Hoy SPA	9499.7 + 2km extension	Breeding: Peregrine Red-throated diver	Breeding: Great skua	Breeding: Seabirds

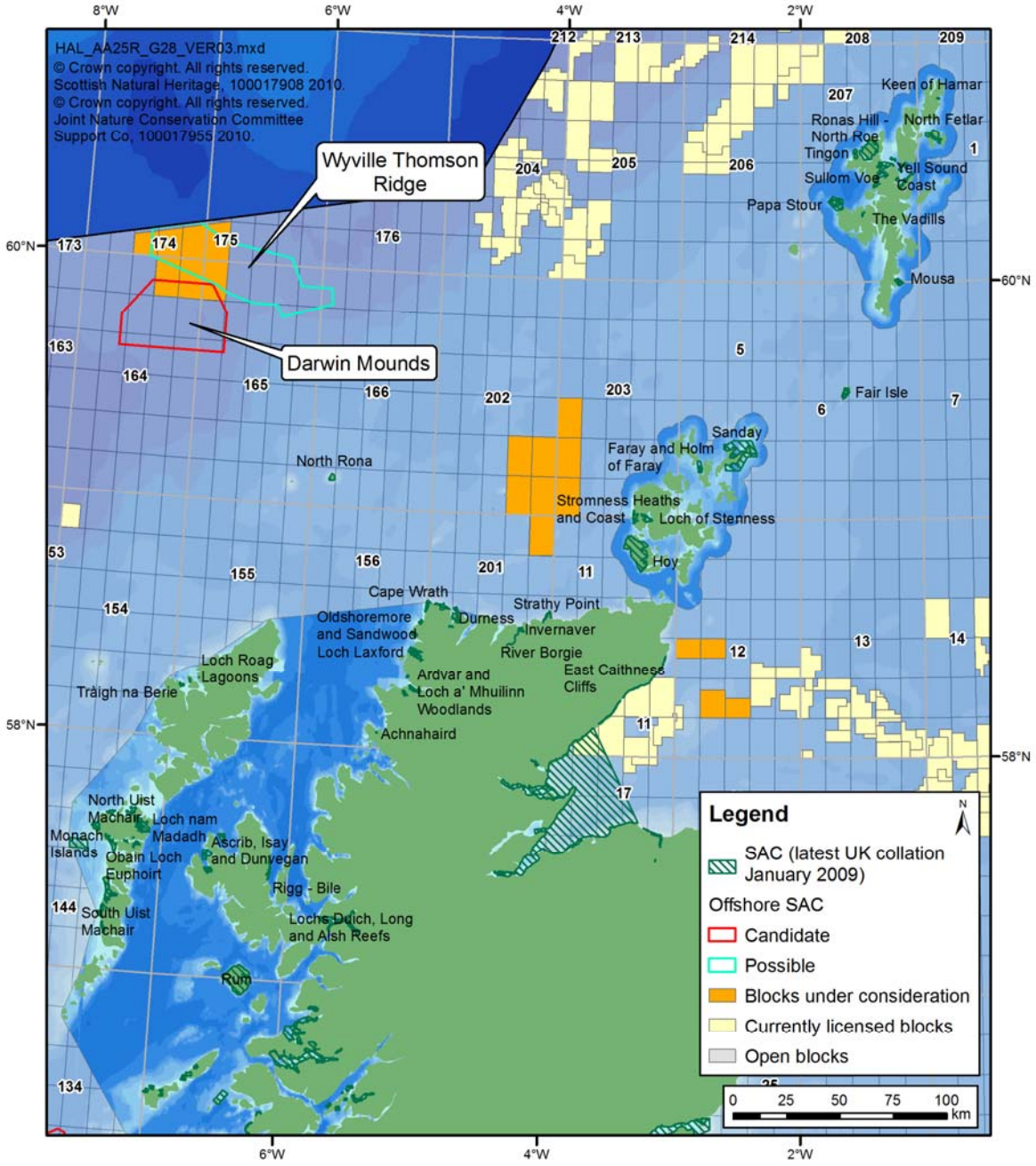
[6] Note: proposed SPA marine extensions are also listed where relevant.
[7] A seabird assemblage of international importance: the area regularly supports at least 20,000 seabirds. Or, a wetland of international importance: the area regularly supports at least 20,000 waterfowl.

Site Name	Area (ha)[6]	Article 4.1 Species	Article 4.2 Migratory species	Article 4.2 Assemblages[7]
Marwick Head SPA	8.7 + 1km extension	N/A	Breeding: Guillemot	Breeding: Seabirds
Rousay SPA	633.41 + 2km extension	Breeding: Arctic tern	N/A	Breeding: Seabirds
West Westray SPA	350.62 + 2km extension	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	238.03 + 2km extension	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	125.42 + 2km extension	N/A	N/A	Breeding: Seabirds
Sule Skerry and Sule Stack SPA	18.9 + 2km extension	Breeding: Leach's storm petrel Storm petrel	Breeding: Gannet Puffin Shag	Breeding: Seabird
MORAY FIRTH AND ABERDEENSHIRE				
East Caithness Cliffs SPA	442.62 + 2km extension	Breeding: Peregrine	Breeding: Guillemot Kittiwake Razorbill Herring gull Shag	Breeding: Seabirds
NORTH COAST OF SCOTLAND				
Caithness Lochs SPA	1378.45	Over winter: Greenland white-fronted goose Whooper swan	Over winter: Greylag goose	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: Common scoter Dunlin Greenshank Wigeon	N/A
North Caithness Cliffs SPA	557.73 + 2km extension	Breeding: Peregrine	Breeding: Guillemot	Breeding: Seabirds
North Sutherland Coastal Islands SPA	221.11	Over winter: Barnacle goose	N/A	N/A
Cape Wrath SPA	1019.18 + 2km extension	N/A	N/A	Breeding: Seabirds
NORTH RONA TO RUM				
North Rona and Sula Sgeir SPA	138.79 + 2km extension	Breeding: Leach's storm petrel	Breeding: Gannet Guillemot	Breeding: Seabird
Flannan Isles SPA	58.87 + 2km extension	Breeding: Leach's storm petrel	N/A	Breeding: Seabird

Site Name	Area (ha)[6]	Article 4.1 Species	Article 4.2 Migratory species	Article 4.2 Assemblages[7]
St Kilda SPA	865.51 + 2km extension	Breeding: Leach's storm petrel	Breeding: Gannet Great skua Puffin	Breeding: Seabird
North Uist Machair and Islands SPA	4876.35	Breeding: Corncrake Over winter: Barnacle goose	Breeding: Dunlin Oystercatcher Redshank Ringed plover Over winter: Purple sandpiper Ringed plover Turnstone	N/A
Mointeach Scadabhaigh SPA	4148.44	Breeding: Black-throated diver Red-throated diver	N/A	N/A
Monach Isles SPA	595.74	Breeding: Common tern Little tern Over winter: Barnacle goose	N/A	N/A
Aird and Borve, Benbecula SPA	361	Breeding: Corncrake	N/A	N/A
South Uist Machair and Lochs SPA	3352.28	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
Eoligarry, Barra SPA	144.04	Breeding: Corncrake	N/A	N/A
Mingulay and Berneray SPA	911.07 + 2km extension	N/A	Breeding: Razorbill	Breeding: Seabird
Handa Island SPA	367.49 + 2km extension	N/A	Breeding: Guillemot Razorbill	Breeding: Seabird
Priest Island SPA	131.68	Breeding: Storm petrel	N/A	N/A
Shiant Isles SPA	212.33 + 2km extension	Over winter: Barnacle goose	Breeding: Puffin Razorbill	Breeding: Seabird
Canna and Sanday SPA	1341.27 + 1km extension			Breeding: Seabird
Rum SPA	10942.38 + 4km extension	Breeding: Golden eagle Red-throated diver	Breeding: Manx shearwater	Breeding: Seabird

A2 Coastal and Marine Special Areas of Conservation

Map A.2 - Coastal and marine Special Areas of Conservation



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 Degraded raised bogs still capable of natural regeneration Depressions on peat substrates of the *Rhynchosporion* Transition mires and quaking bogs
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	Estuaries
Fens	Alkaline fens Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* * Priority feature Petrifying springs with tufa formation (*Cratoneurion*) * Priority feature
Forest	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
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 European dry heaths Northern Atlantic wet heaths with *Erica tetralix*
Inlets and bays	Large shallow inlets and bays

Annex I Habitat (abbreviated)	Annex I Habitat(s) (full description)
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
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. 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.2 - Coastal and marine SACs 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

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Yell Sound Coast SAC	1540.55	N/A	N/A	Otter *Lutra lutra* Common seal *Phoca vitulina*	N/A
Keen of Hamar SAC	38.52	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	Common seal *Phoca vitulina*	N/A
Fair Isle SAC	561.27	Sea cliffs	Heaths	N/A	N/A
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	Common seal *Phoca vitulina*	N/A
MORAY FIRTH AND ABERDEENSHIRE					
East Caithness Cliffs SAC	442.64	Sea cliffs	N/A	N/A	N/A
NORTH COAST OF SCOTLAND					
Strathy Point SAC	203.58	Sea cliffs	N/A	N/A	N/A
River Borgie SAC	32.72	N/A	N/A	Freshwater pearl mussel *Margaritifera margaritifera*	Atlantic salmon *Salmo salar* Otter *Lutra lutra*
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	1018.18	Sea cliffs	N/A	N/A	N/A
NORTH RONA TO RUM					

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
North Rona SAC	628.53	N/A	Reefs Sea cliffs Sea caves	Grey seal *Halichoerus grypus*	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
Monach Islands SAC	3646.58	Machairs	Coastal dunes	Grey seal *Halichoerus grypus*	N/A
Obain Loch Euphoirt SAC	348.59	Coastal lagoons	N/A	N/A	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*
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
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
Ascrib, Isay and Dunvegan SAC	2584.99	N/A	N/A	Common seal *Phoca vitulina*	N/A
Rigg - Bile SAC	500.89	Sea cliffs	Forest	N/A	N/A
Lochs Duig, 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	10835.33	Standing freshwater Heaths Grasslands Scree	Sea cliffs Heaths Grasslands Bogs Fens Scree Rocky slopes	Otter *Lutra lutra*	N/A

A3 Offshore Special Areas of Conservation

Map A.3 - Location of offshore SACs to the north of the Hebrides

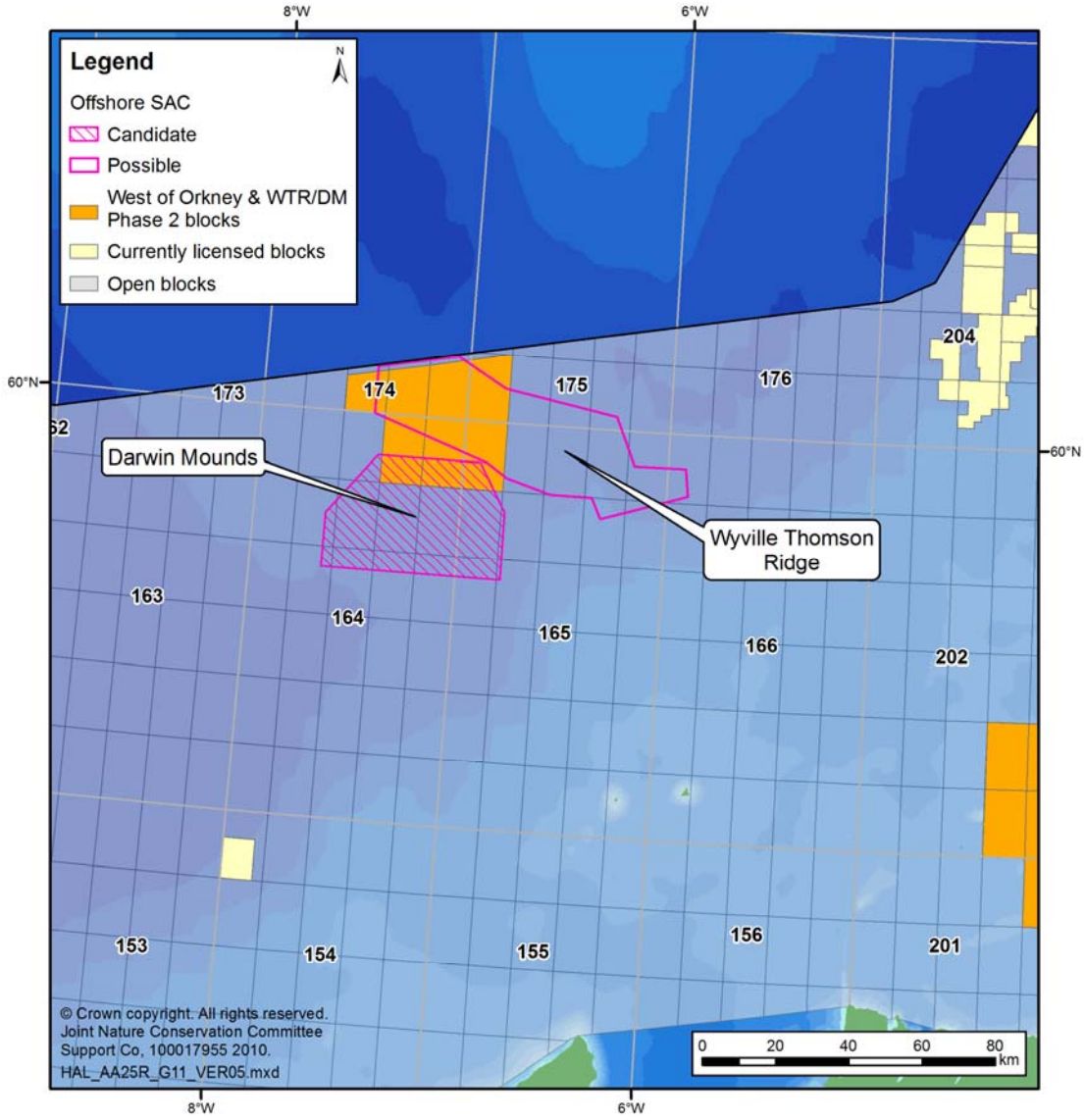


Table A.3 - Relevant offshore SACs and their Qualifying Features

Site Name	Area (ha)	Annex I Habitat Qualifying	Annex II Species Qualifying
Darwin Mounds cSAC	137,726	Reefs (biogenic *Lophelia pertusa*)	N/A
Wyville Thomson Ridge pSAC	173,995	Reefs	N/A

A4 Riverine Special Areas of Conservation

In addition to the mapped SACs, the following riverine SACs designated for migratory fish and/or freshwater pearl mussel are also considered.

Table A.4 – Riverine SACs designated for migratory fish and/or the freshwater pearl mussel

Site Name	**Freshwater pearl mussel** ***Margaritifera margaritifera***	**Migratory fish**[1]
Berriedale and Langwell Waters	-	AS
River Thurso	-	AS
River Naver	✓	AS
Langavat	-	AS
North Harris	✓	AS
Abhainn Clais an Eas and Allt a'Mhuilinn	✓	-
Little Gruinard River	-	AS
River Kerry	✓	-

[1] *AS - Atlantic salmon Salmo salar*

APPENDIX B – SCREENING TABLES FOR IDENTIFICATION OF POTENTIAL EFFECTS ON THE SITES

B1 Coastal and marine Special Protection Areas

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
SHETLAND								
Sumburgh Head	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Lochs of Spiggie and Brow	-	✓	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Foula	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
Papa Stour	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Ronas Hill-North Roe and Tingon	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Ramna Stacks and Gruney	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Otterswick and Graveland	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
Hermaness, Saxa Vord and Valla Field	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Fetlar	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Noss	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Mousa	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Fair Isle	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
ORKNEY								
Pentland Firth Islands	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
Switha	-	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. Due to the lack of utilisation of the marine environment by qualifying features (wintering geese), site integrity would not be affected by accidental spills.
Orkney Mainland Moors	✓	✓	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Hoy	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Marwick Head	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
Rousay	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
West Westray	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Papa Westray (North Hill and Holm)	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Calf of Eday	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
East Sanday Coast	-	✓	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Auskerry	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Copinsay	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Sule Skerry and Sule Stack	✓	-	-	✓	✓	✓	-	Despite partial block-site overlap, site integrity would not be affected by physical disturbance or emissions or discharges from routine operations due to mitigation. In the unlikely event of a crude or fuel oil spill, spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
MORAY FIRTH AND ABERDEENSHIRE								

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
East Caithness Cliffs	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
NORTH COAST OF SCOTLAND								
Caithness Lochs	-	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. Due to the lack of utilisation of the marine environment by qualifying features (wintering geese), site integrity would not be affected by accidental spills.
Caithness and Sutherland Peatlands	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
North Caithness Cliffs	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
North Sutherland Coastal Islands	-	✓	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Cape Wrath	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
NORTH RONA TO RUM								
North Rona and Sula Sgeir	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Flannan Isles	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
St Kilda	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
North Uist Machair and Islands	✓	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Mointeach Scadabhaigh	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Monach Isles	✓	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Aird and Borve, Benbecula	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
South Uist Machair and Lochs	✓	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Kilpheder to Smerclate, South Uist	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Eoligarry, Barra	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Mingulay and Berneray	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
Handa Island	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Priest Island	✓	-	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Shiant Isles	✓	✓	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the features present, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Canna and Sanday	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Rum	✓	-	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.

Notes: 1 ✓ denotes feature present; 2 ✓ denotes vulnerability to effect; 3 including all liquid phase hydrocarbons

B2 Coastal and marine Special Areas of Conservation

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
SHETLAND							
The Vadills	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Papa Stour	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Tingon	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Ronas Hill - North Roe	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Sullom Voe	✓	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the habitat feature present (shallow inlets and bays), although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Yell Sound Coast	-	✓	✓	-	✓	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to the species feature (common seal) beyond site boundaries, although mitigation is possible. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the species features present (otter, common seal), although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Keen of Hamar	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
North Fetlar	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Mousa	✓	✓	-	-	✓	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to the species feature (common seal) beyond site boundaries, although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Fair Isle	✓	✓	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
ORKNEY							
Hoy	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Loch of Stenness	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Stromness Heaths and Coasts	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Faray and Holm of Faray	-	✓	✓	-	✓	✓	Site is remote from blocks and integrity would not be affected by emissions or discharges from routine operations. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to the species feature (grey seal), although mitigation is possible. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the species feature present (grey seal), although mitigation would be possible. It is noted that this site could potentially be influenced by renewable (wave and tidal) energy developments in the Pentland Firth/Orkney area; however, mitigation is possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Sanday	✓	✓	✓	-	✓	✓	Site is remote from blocks and integrity would not be affected by emissions or discharges from routine operations. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to the species feature (common seal), although effects on site integrity are unlikely. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect some of the features present (intertidal sand and mudflats, common seal), although mitigation would be possible. It is noted that this site could potentially be influenced by renewable (wave and tidal) energy developments in the Pentland Firth/Orkney area; however, mitigation is possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
MORAY FIRTH AND ABERDEENSHIRE							
East Caithness Cliffs	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
NORTH COAST OF SCOTLAND							

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Strathy Point	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
River Borgie	-	✓	-	-	✓	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to the species feature (Atlantic salmon) outside of the site boundaries, although mitigation is possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Invernaver	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Durness	✓	✓	✓	-	-	-	Site is remote from blocks and integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the species feature present (otter), although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Cape Wrath	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
NORTH RONA TO RUM							

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
North Rona	✓	✓	✓	-	✓	-	Site is remote from blocks and integrity would not be affected by emissions or discharges from routine operations. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to the species feature (grey seal), although effects on site integrity are unlikely. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the species feature present (grey seal), although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Loch Roag Lagoons	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Tràigh na Berie	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
St Kilda	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
North Uist Machair	✓	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Loch nam Madadh	✓	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Monach Islands	✓	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Obain Loch Euphoirt	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
South Uist Machair	✓	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Oldshoremore and Sandwood	✓	-	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Loch Laxford	✓	-	✓	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the habitat feature present (shallow inlets and bays), although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Ardvar and Loch a' Mhuilinn Woodlands	✓	✓	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Achnahaird	-	✓	-	-	-	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Ascrib, Isay and Dunvegan	-	✓	✓	-	✓	-	Site is remote from blocks and integrity would not be affected by emissions or discharges from routine operations. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to the species feature (common seal), although mitigation would be possible. In the unlikely event of a major crude oil spill, weathered spilled oil could theoretically affect the species feature present (common seal), although mitigation would be possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Rigg - Bile	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Lochs Duig, Long and Alsh Reefs	✓	-	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Rum	✓	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.

Notes: 1 ✓ denotes feature present; 2 ✓ denotes vulnerability to effect; 3 including all liquid phase hydrocarbons

B3 Offshore Special Areas of Conservation

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Wyville Thomson Ridge	✓	-	-	✓	-	✓	Due to site-block overlap, site may be affected by physical disturbance, although mitigation is possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known. Due to the nature of the feature present, site integrity would not be affected by accidental spills.
Darwin Mounds	✓	-	-	✓	-	✓	Due to site-block overlap, site may be affected by physical disturbance, although mitigation is possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known. Due to the nature of the feature present, site integrity would not be affected by accidental spills.

Notes: 1 ✓ denotes feature present; 2 ✓ denotes vulnerability to effect; 3 including all liquid phase hydrocarbons

B4 Riverine Special Areas of Conservation

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	

Site name	Features present[1]		Effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Berriedale and Langwell Waters	-	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
River Thurso	-	✓	-	-	✓	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to the species feature (Atlantic salmon), although mitigation is possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
River Naver	-	✓	-	-	✓	-	Due to nature of feature(s) present, site integrity would not be affected by emissions or discharges from routine operations or accidental spills. Certain activities (i.e. seismic survey) may cause temporary acoustic disturbance to one of the species features (Atlantic salmon), although mitigation is possible. Such mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Langavat	-	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
North Harris	✓	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Abhainn Clais an Eas and Allt a'Mhuilinn	-	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
Little Gruinard River	-	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.
River Kerry	-	✓	-	-	-	-	Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills.

Notes: 1 ✓ denotes feature present; 2 ✓ denotes vulnerability to effect; 3 including all liquid phase hydrocarbons

APPENDIX C – DETAILED INFORMATION ON NATURA 2000 SITES WHERE THE POTENTIAL FOR EFFECTS HAVE BEEN IDENTIFIED

C1 Special Protection Areas

The following tables provide detailed information of the relevant sites, including full listing of their qualifying features. Where available, information is provided on the assessed condition of the qualifying features, as stated on the SNH sitelink website.

Site Name: Sumburgh Head SPA	
Location	Grid Ref: HU410091 (central point) Latitude 59º51'55"N Longitude 01º16'05"W
Area (ha)	39.04 + 2km offshore extension
Summary	Sumburgh Head is located at the southernmost tip of the Shetland mainland. The site comprises boulder-strewn beaches and cliffs up to 100m high along the east side of Sumburgh Head. The site is of importance as a breeding area for several species of seabirds, including terns, auks and gulls. These birds feed outside the SPA, both in the waters immediately around Sumburgh Head and further afield.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Arctic tern *Sterna paradisaea*, 700 pairs representing at least 1.6% of the breeding population in Great Britain (Count as 1994) [unfavourable declining] ***Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds*** ***Assemblage qualification: A seabird assemblage of international importance.*** During the breeding season, the area regularly supports 35,000 individual seabirds (count period ongoing) including: guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, fulmar *Fulmarus glacialis*, Arctic tern *Sterna paradisaea* [all favourable maintained, except kittiwake and Arctic tern: unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Lochs of Spiggie and Brow SPA	
Location	Grid Ref: HU373166 (central point) Latitude 59º56'00"N Longitude 01º20'00"W
Area (ha)	141.48
Summary	The Lochs of Spiggie and Brow are located at the south of the mainland of Shetland. They are the largest 'machair type 'lochs in Shetland. Both lochs have slightly brackish conditions, and the sand and mud substrates are dominated by a range of stonewort species and aquatic mosses. The lochs are of importance as both a migratory staging area and wintering site for Icelandic whooper swan. As well as feeding on the lochs, the swans also feed away from the SPA on surrounding agricultural land.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **Over winter:** Whooper swan *Cygnus cygnus*, 143 individuals representing up to 2.6% of the wintering population in Great Britain (5 year peak mean 1991/2-1995/6) [favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Foula SPA	
Location	Grid Ref: HT954393 (central point) Latitude 60º08'20"N Longitude 02º05'00"W
Area (ha)	1323.31 + 2km offshore extension
Summary	Foula is the most westerly of the Shetland Islands, lying 20km west of the Shetland mainland, and is the most isolated inhabited island in the UK. The island is formed of Old Red Sandstone with a low-lying eastern side rising steeply to a central ridge and terminating on the western coast in sea-cliffs, including the Kame at 317m height. The island is important for a wide range of breeding seabirds, with different species nesting in different parts of the island. It is one of only seven known nesting localities in the EU for Leach's petrel. The seabirds feed outside the SPA in nearby waters, as well as more distantly in the North Atlantic.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Arctic tern *Sterna paradisaea*, 1,100 pairs representing at least 2.5% of the breeding population in Great Britain (5 year mean, 1992-1996) [favourable maintained]

Leach's storm-petrel *Oceanodroma leucorhoa*, 50 pairs representing at least 0.1% of the breeding population in Great Britain (Count as at 1976) [unfavourable declining]

Red-throated diver *Gavia stellata*, 11 pairs representing at least 1.2% of the breeding population in Great Britain (1994 national survey) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Great skua *Catharacta skua*, 2,170 pairs representing at least 16.0% of the breeding World population (Count, as at 1992) [favourable maintained]

Guillemot *Uria aalge*, 25,125 pairs representing at least 1.1% of the breeding East Atlantic population (Count as at 1987) [favourable maintained]

Puffin *Fratercula arctica*, 48,000 pairs representing at least 5.3% of the breeding population (Count, as at 1987) [favourable maintained]

Shag *Phalacrocorax aristotelis*, 2,400 pairs representing at least 1.9% of the breeding Northern Europe population (1987) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 250,000 individual seabirds including: Leach's storm-petrel *Oceanodroma leucorhoa*, razorbill *Alca torda*, kittiwake *Rissa tridactyla*, Arctic skua *Stercorarius parasiticus*, fulmar *Fulmarus glacialis*, puffin *Fratercula arctica*, guillemot *Uria aalge*, great skua *Catharacta skua*, shag *Phalacrocorax aristotelis*, Arctic tern *Sterna paradisaea* [all favourable maintained, except fulmar, razorbill and Leach's storm petrel: unfavourable declining]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: Papa Stour SPA	
Location	Grid Ref: HU166613 (central point) Latitude 60º20'10"N Longitude 01º42'00"W
Area (ha)	569.03
Summary	Papa Stour lies on the west coast of mainland Shetland. The SPA comprises the northern and western parts of Papa Stour and consists of rocky hillsides rising to about 90m, a number of lochs and a few offshore skerries. The main vegetation is a lichen-rich heath that has developed on substrates that formerly consisted of peat and turf. The island is an important breeding site for Arctic tern and ringed plover. The terns feed outside the SPA in the waters around the islands.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Arctic tern *Sterna paradisaea*, 1,000 pairs representing at least 2.3% of the breeding population in Great Britain (Seabird Census Register) [unfavourable declining]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Ringed plover *Charadrius hiaticula*, 89 pairs representing at least 0.6% of the breeding Europe/Northern Africa - wintering population [favourable maintained]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: Ronas Hill - North Roe and Tingon SPA	
Location	Grid Ref: HU320852 (central point) Latitude 60º33'00"N Longitude 01º25'00"W
Area (ha)	5470.2
Summary	Ronas Hill – North Roe and Tingon SPA is located in the north mainland of. The site comprises two adjacent headlands separated by the large Ronas Voe. Most of the site is composed of active blanket bog with numerous lochans and pools that support a typical peatland avifauna. The flatter parts of Tingon and North Roe have many pools and acidic lochans set within an open landscape of blanket bog and maritime heath. The area holds some of the highest-quality blanket bog in Shetland, which is floristically rich and intact. The site is of importance for breeding red-throated diver and merlin.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Great skua *Catharacta skua*, 128 pairs representing 0.9% of the breeding world population (Count, as at 1992) [favourable maintained] Merlin *Falco columbarius*, 6 pairs representing at least 0.5% of the breeding population in Great Britain [favourable maintained] Red-throated diver *Gavia stellata*, 50 pairs representing at least 5.3% of the breeding population in Great Britain (Count, as at 1994) [favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Ramna Stacks and Gruney SPA	
Location	Grid Ref: HU166613 (central point) Latitude 60º39'10"N Longitude 01º18'10"W
Area (ha)	11.59
Summary	Ramna Stacks and Gruney lie north of mainland Shetland. With the exception of Gruney, where guano-enriched maritime grassland occurs, these rocky islands support little or no vegetation. They are of importance as a site for breeding seabirds, particularly as one of only seven known nesting localities in the EU for Leach's petrel. The nesting seabirds using the site feed outside the SPA in surrounding and more distant marine areas.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Leach's storm-petrel *Oceanodroma leucorhoa*, 22 pairs representing at least 0.0% of the breeding population in Great Britain (Count, as at 1994) [favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Otterswick and Graveland SPA	
Location	Grid Ref: HU488857 (central point) Latitude 59º35'42"N Longitude 01º08'07"W
Area (ha)	2241.41
Summary	Otterswick and Graveland are located on the island of Yell, in Shetland. Otterswick lies to the south of Yell, whilst Graveland is a peninsula on the west coast of the island. Inland areas are dominated by blanket bog, with some stretches of dry heather moorland. A band of maritime grassland extends along the coastal stretch of the Graveland peninsula. The site is of European importance as a breeding area for red-throated diver *Gavia stellata.*
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Red-throated diver *Gavia stellata*, 27 pairs representing at least 2.9% of the breeding population in Great Britain (1992-1996) [favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Fair Isle SPA	
Location	Grid Ref: HZ216724 (central point) Latitude 59º32'15"N Longitude 01º37'00"W
Area (ha)	561.27 + 2km offshore extension
Summary	Fair Isle is located in the North Sea, halfway between the Shetland mainland and the Orkney Islands in northern Scotland. It is partly composed of Old Red Sandstone that has weathered to produce a greatly indented coastline with many geos, stacks and crags. The island is of major importance as a breeding area for seabirds, including skuas, terns, gulls and auks. It is also notable for its endemic race of wren *Troglodytes troglodytes fridariensis.* The seabirds nest both on the cliffs and crags around the island as well as on moorland and maritime grassland areas, and feed in the waters around the island, outside the SPA. The SPA includes the entire coastline of the island together with an extensive area of moorland and grassland in the north of the island.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Arctic tern *Sterna paradisaea*, 1,120 pairs representing at least 2.5% of the breeding population in Great Britain (5 year mean, 1993-1997) [favourable maintained]

Fair Isle wren *Troglodytes troglodytes fridariensis*, 37 individuals representing 100.0% of the breeding population in Great Britain (Count, as at 1997) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Guillemot *Uria aalge*, 25,165 pairs representing at least 1.1% of the breeding East Atlantic population (Count as at 1994) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 180,000 individual seabirds including: puffin *Fratercula arctica*, razorbill *Alca torda*, kittiwake *Rissa tridactyla*, great skua *Catharacta skua*, Arctic skua *Stercorarius parasiticus*, shag *Phalacrocorax aristotelis*, gannet *Morus bassanus*, fulmar *Fulmarus glacialis*, guillemot *Uria aalge*, Arctic tern *Sterna paradisaea* [all favourable maintained, except shag: unfavourable recovering]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: Pentland Firth Islands SPA	
Location	Grid Ref: ND387842 (central point) Latitude 58º 44'30"N Longitude 03º 03'30"W
Area (ha)	170.51
Summary	The Pentland Firth Islands are located between the Orkney Islands and the mainland coast of northeast Scotland. They are a group of two main islands, Swona and Muckle Skerry, and a group of rocky skerries in the Pentland Firth. The islands contain a variety of habitats, including cliffs, rocky shores, maritime heath, moorland, rough grassland, marsh and open freshwater. They provide strategic nesting localities for Arctic tern which feed outside the SPA in the rich surrounding waters of the Pentland Firth.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Arctic tern *Sterna paradisaea*, 1,200 pairs representing at least 2.7% of the breeding population in Great Britain (4 year mean 1992-1995) [unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Orkney Mainland Moors SPA	
Location	Grid Ref: HY351223 (central point) Latitude 59º 05'00"N Longitude 03º 08'00"W
Area (ha)	4444.35
Summary	Orkney Mainland Moors SPA comprises four areas of moorland on the mainland of Orkney. The predominant habitats include extensive areas of blanket bog, acid grassland, wet and dry heath, raised-mire and calcareous valley mire. The presence of extensive moorland provides nesting opportunities for an assemblage of moorland breeding birds, including hen harrier and short-eared owl. Sheltered river valleys and dales support willow *Salix* spp. scrub, tall-herb and flush vegetation, and there are several scattered oligotrophic lochans present on part of the SPA, which provide important breeding areas for red-throated diver.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Hen harrier *Circus cyaneus*, 30 pairs representing at least 6.0% of the breeding population in Great Britain (as of 1998) [favourable maintained] Red-throated diver *Gavia stellata*, 15 pairs representing at least 1.6% of the breeding population in Great Britain (1994-1996) [favourable maintained] Short-eared owl *Asio flammeus*, 20 pairs representing at least 2.0% of the breeding population in Great Britain (RSPB mid 1990s est) [favourable maintained] **Overwinter:** Hen harrier *Circus cyaneus*, 13 individuals representing at least 1.7% of the wintering population in Great Britain (Count mean (1994-98)) [favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Hoy SPA	
Location	Grid Ref: ND238974 (central point) Latitude 58º 51'30"N Longitude 03º 19'10"W
Area (ha)	9499.7 + 2km offshore extension
Summary	Hoy is one of the most southerly of the major islands of the Orkney archipelago in northern Scotland. The Hoy SPA covers the northern and western two-thirds of the island, which is formed of Old Red Sandstone and contains Orkney's highest hills. Most of the island is moorland, drained by numerous streams with diverse vegetation. On the west coast, Old Red Sandstone cliffs reach 339m in height and include a number of notable stacks and crags. These cliffs provide important breeding sites for a number of seabird species, especially gulls and auks, whilst moorland areas support large numbers of breeding birds, in particular great skua. Red-throated diver nest on the numerous small lochans found on the moorland. The divers and seabirds feed in the rich waters around Hoy, outside the SPA.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Peregrine *Falco peregrinus*, 6 pairs representing at least 0.5% of the breeding population in Great Britain (Mid-1990s) [favourable maintained]

Red-throated diver *Gavia stellata*, 56 pairs representing at least 6.0% of the breeding population in Great Britain (1994 National Survey) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Great skua *Catharacta skua*, 1,900 pairs representing at least 14.0% of the breeding World population (Seabird Census Register) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 120,000 individual seabirds including: puffin *Fratercula arctica*, guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, great black-backed gull *Larus marinus*, Arctic skua *Stercorarius parasiticus*, fulmar *Fulmarus glacialis* and great skua *Catharacta skua* [all favourable maintained, except puffin and kittiwake: unfavourable declining]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: Marwick Head SPA	
Location	Grid Ref: HY226250 (central point) Latitude 59º 06'20"N Longitude 03º 21'00"W
Area (ha)	8.7 + 1km offshore extension
Summary	Marwick Head lies on the west coast of the island of Mainland in the Orkney archipelago. The site comprises a 2km section of high, eroded Old Red Sandstone cliffs rising to 85m and backed by cliff-top maritime grassland. The site is of importance as a nesting area for large numbers of guillemot and kittiwake. These species feed outside the SPA in surrounding marine areas.
Qualifying features for which the site is designated [condition]:	
Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **During the breeding season:** Guillemot *Uria aalge*, 24,388 pairs representing up to 1.1% of the breeding East Atlantic population (Count as at 1991) [favourable maintained] ***Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds*** ***Assemblage qualification: A seabird assemblage of international importance.*** During the breeding season, the area regularly supports 75,000 individual seabirds including: kittiwake *Rissa tridactyla* and guillemot *Uria aalge* [unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Rousay SPA	
Location	Grid Ref: HY371331 (central point) Latitude 59º 10'50"N Longitude 03º 06'00"W
Area (ha)	633.41 + 2km offshore extension
Summary	Rousay is an island off the north-east coast of the Mainland in the Orkney archipelago, in northern Scotland. The site is composite and consists of two parts located at the northwest and northeast ends of the island. The site holds a diverse assemblage of breeding seabirds, including terns, auks, gulls and skuas. The nesting seabirds feed in the waters around Rousay outside the SPA, as well as further away.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Arctic tern *Sterna paradisaea*, 1,000 pairs representing at least 2.3% of the breeding population in Great Britain (Seabird Census Register) [favourable maintained] ***Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds*** ***Assemblage qualification: A seabird assemblage of international importance.*** During the breeding season, the area regularly supports 30,000 individual seabirds (three year mean, 1986-1988) including: guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, Arctic skua *Stercorarius parasiticus*, fulmar *Fulmarus glacialis* and Arctic tern *Sterna paradisaea* [unfavourable declining, except Arctic tern and Arctic skua: favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: West Westray SPA	
Location	Grid Ref: HY423457 (central point) Latitude 59º 17'40"N Longitude 03º 00'45"W
Area (ha)	350.62 + 2km offshore extension
Summary	The SPA is located on the west coast of the island of Westray, one of the most northerly of the Orkney islands. The site comprises an 8km length of Old Red Sandstone cliffs, together with adjoining areas of species-rich maritime grassland and heath. The cliffs support large colonies of breeding auks and kittiwake, whilst the grassland and heathland areas support breeding colonies of skuas and terns. The seabirds feed in the surrounding waters outside the SPA.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Arctic tern *Sterna paradisaea*, 1,200 pairs representing at least 2.7% of the breeding population in Great Britain (Count, as at 1997) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Guillemot *Uria aalge*, 28,274 pairs representing at least 1.3% of the breeding East Atlantic population (Count as at 1988) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 120,000 individual seabirds including: razorbill *Alca torda*, kittiwake *Rissa tridactyla*, Arctic skua *Stercorarius parasiticus*, fulmar *Fulmarus glacialis*, guillemot *Uria aalge* and Arctic tern *Sterna paradisaea* [favourable maintained]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: Papa Westray (North Hill and Holm) SPA	
Designation	Special Protection Area
Location	Grid Ref: HT507105 (central point) Latitude 59º 22'40"N Longitude 02º 52'45"W
Area (ha)	245.71
Summary	Papa Westray is a small island lying close to Westray in the northern Orkney islands. The island rises to 48m above sea level at North Hill and is surrounded by a rocky coastline backing onto maritime sedge heath. The Holm is a small, low-lying island of 48ha off the east coast of Papa Westray dominated by a rocky coastline and maritime grassland. The islands are an important breeding site for both Arctic tern and Arctic skua. The terns feed outside the SPA in the waters surrounding the islands.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Arctic tern *Sterna paradisaea*, 1,950 pairs representing at least 4.4% of the breeding population in Great Britain (Count, as at 1997) [favourable maintained] ***Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:*** **During the breeding season:** Arctic skua *Stercorarius parasiticus*, 135 pairs representing at least 0.4% of the breeding North Atlantic population (Seabird Census Register) [unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Calf of Eday SPA	
Location	Grid Ref: HY584394 (central point) Latitude 59º 14'24"N Longitude 02º 43'48"W
Area (ha)	238.03 + 2km offshore extension
Summary	The Calf of Eday is a small, uninhabited island located to the north of the island of Eday in the Orkney archipelago. The island has a rocky coastline with cliffs on the north and east coasts. The dominant vegetation on the island is dry dwarf-shrub heath dominated by heather, with smaller areas of wet heath, semi-improved grassland and coastal grassland. The site is of importance as a nesting area for breeding seabirds, which feed in surrounding waters outside the SPA. Gulls and cormorant nest in the dry heath and grassland areas, whilst fulmar, kittiwake and auks nest on the cliffs.
Qualifying features for which the site is designated [condition]:	
Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **During the breeding season:** Guillemot *Uria aalge*, 24,388 pairs representing up to 1.1% of the breeding East Atlantic population (as of 1991) [unfavourable declining] ***Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds*** ***Assemblage qualification: A seabird assemblage of international importance.*** During the breeding season, the area regularly supports 30,000 individual seabirds (as of 1997) including: guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, great black-backed gull *Larus marinus*, cormorant *Phalacrocorax carbo*, fulmar *Fulmarus glacialis* [unfavourable declining, except great black-backed gull and fulmar: favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: East Sanday Coast SPA	
Location	Grid Ref: HY676423 (central point) Latitude 59º 16'00"N Longitude 02º 34'00"W
Area (ha)	1515.23
Summary	East Sanday Coast SPA is located on the island of Sanday in the Orkney Islands of northern Scotland. The site comprises a 55km stretch of coast, and consists of both rocky and sandy sections. The coastline supports internationally important populations of wintering waders.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **Over winter:** Bar-tailed godwit *Limosa lapponica*, 600 individuals representing at least 1.1% of the wintering population in Great Britain (Winter peak mean 1991/2-1993/4) [favourable maintained] ***Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:*** **Over winter:** Purple sandpiper *Calidris maritima*, 840 individuals representing at least 1.7% of the wintering Eastern Atlantic - wintering population (winter peak means) [unfavourable declining] Turnstone *Arenaria interpres*, 1,400 individuals representing at least 2.0% of the wintering Western Palearctic - wintering population (three year peak mean, 1991/2-1993/4) [unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Auskerry SPA	
Location	Grid Ref: HY674163 (central point) Latitude 59º 02'00"N Longitude 02º 34'00"W
Area (ha)	101.97
Summary	Auskerry is a small, uninhabited low-lying island situated 5km south of Stronsay in the Orkney Islands. The shore is a mixture of rocky platforms interspersed with low cliffs and boulder/shingle beaches. The site is important as a nesting area for a number of breeding seabirds. These birds feed outside the SPA in the waters surrounding the island, as well as more distant waters.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Arctic tern *Sterna paradisaea*, 780 pairs representing at least 1.8% of the breeding population in Great Britain (4 year mean, 1992-1995) [favourable maintained] Storm petrel *Hydrobates pelagicus*, 3,600 pairs representing at least 4.2% of the breeding population in Great Britain (Count, as at 1995) [unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Copinsay SPA	
Location	Grid Ref: HY611015 (central point) Latitude 58º 54'00"N Longitude 02º 40'30"W
Area (ha)	125.42 + 2km offshore extension
Summary	Copinsay lies 4km off the east coast of Orkney Mainland. It consists of the island of Copinsay and three islets (Corn Holm, Ward Holm and Black Holm). The three holms are vegetated and a storm beach connects them to Copinsay at low water. Copinsay is formed of Old Red Sandstone with the largely horizontal bedding planes providing ideal breeding ledges for seabirds (auks and kittiwake), especially on the sheer cliffs of the southeast of Copinsay which reach to over 60m. The seabirds feed outside the SPA in the nearby waters, as well as more distantly.
Qualifying features for which the site is designated [condition]:	
Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds ***Assemblage qualification: A seabird assemblage of international importance.*** During the breeding season, the area regularly supports 70,000 individual seabirds including: guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, great black-backed gull *Larus marinus* and fulmar *Fulmarus glacialis* [unfavourable declining, except kittiwake: unfavourable recovering; and fulmar and great black-backed gull: favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Sule Skerry and Sule Stack SPA	
Location	Grid Ref: HX622244 (central point) Latitude 59º05'05"N Longitude 04º24'15"W
Area (ha)	18.9 + 2km offshore extension
Summary	The two small and remote islands of Sule Skerry and Sule Stack lie west of Orkney. Sule Skerry is about 60km from Orkney, while Sule Stack is a further 8km to the south-west. Sule Skerry is the larger of the two islands, covering about 16ha, is low-lying and covered by peaty soil with rocky outcrops. Vegetation is limited by the combination of salt spray and seabird activity. Sule Stack is a higher, bare rock with no vascular plants. The islands provide strategically placed nesting localities for large numbers of seabirds which feed in the waters off the north coast of Scotland outside the SPA. They also hold a diverse assemblage of largely pelagic species, including large numbers of petrels, auks and Gannet. It is one of only seven known nesting localities in the EU for Leach's petrel.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Leach's storm-petrel *Oceanodroma leucorhoa*, 5 pairs representing at least 0.0% of the breeding population in Great Britain (Count, as at 1986) [favourable maintained]

Storm petrel *Hydrobates pelagicus*, 1,000 pairs representing at least 1.2% of the breeding population in Great Britain (Count, as at 1986) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Gannet *Morus bassanus*, 4,890 pairs representing at least 1.9% of the breeding North Atlantic population (Count, as at 1994) [favourable maintained]

Puffin *Fratercula arctica*, 43,380 pairs representing at least 4.8% of the breeding population (Count, as at 1993) [favourable maintained]

Shag *Phalacrocorax aristotelis*, 700 pairs representing 0.6% of the breeding Northern Europe population (Count as at 1993) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 100,000 individual seabirds including: Leach's storm-petrel *Oceanodroma leucorhoa*, guillemot *Uria aalge*, shag *Phalacrocorax aristotelis*, puffin *Fratercula arctica*, gannet *Morus bassanus*, storm petrel *Hydrobates pelagicus* [all favourable maintained]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: East Caithness Cliffs SPA	
Location	Grid Ref: ND214331 (central point) Latitude 58º16'49"N Longitude 03º20'21"W
Area (ha)	442.62 + 2km offshore extension
Summary	The East Caithness Cliffs SPA is located on the east coast of Caithness in northern Scotland. The site comprises most of the sea-cliff areas between Wick and Helmsdale. The cliffs are formed from Old Red Sandstone and are generally between 30-60m high, rising to 150m at Berriedale. Cliff ledges, stacks and geos provide ideal nesting sites for internationally important populations of seabirds, especially gulls and auks. The seabirds nesting on the East Caithness Cliffs feed outside the SPA in inshore waters as well as further away. The cliffs also provide important nesting habitat for peregrine. The cliffs overlook the Moray Firth, an area that provides rich feeding areas for fish-eating seabirds.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Peregrine *Falco peregrinus*, 6 pairs representing at least 0.5% of the breeding population in Great Britain (Mid-1990s)

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Guillemot *Uria aalge*, 71,509 pairs representing at least 3.2% of the breeding East Atlantic population (Count as at 1986) [favourable maintained]

Herring Gull *Larus argentatus*, 9,370 pairs representing at least 1.0% of the breeding Northwestern Europe (breeding) and Iceland/Western Europe - breeding population (Count, as at 1986) [unfavourable declining]

Kittiwake *Rissa tridactyla*, 31,930 pairs representing at least 1.0% of the breeding Eastern Atlantic - Breeding population (Count, as at 1986) [favourable maintained]

Razorbill *Alca torda*, 9,259 pairs representing at least 1.6% of the breeding population (1986) [favourable maintained]

Shag *Phalacrocorax aristotelis*, 2,345 pairs representing at least 1.9% of the breeding Northern Europe population (Count as at 1986) [unfavourable declining]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 300,000 individual seabirds including: puffin *Fratercula arctica*, great black-backed gull *Larus marinus*, cormorant *Phalacrocorax carbo*, fulmar *Fulmarus glacialis*, razorbill *Alca torda*, guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, herring gull *Larus argentatus*, shag *Phalacrocorax aristotelis* [favourable maintained, except shag, cormorant, great black-backed gull and herring gull: unfavourable declining]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: Caithness and Sutherland Peatlands SPA	
Location	Grid Ref: NC866402 (central point) Latitude 58º 20' 10"N Longitude 03º 56' 15"W
Area (ha)	145,516.75
Summary	The Caithness & Sutherland Peatlands are located across the northernmost parts of mainland Scotland. The SPA contains a large proportion of these peatlands, which form one of the largest and most intact areas of blanket bog in the world. The peatlands include an exceptionally wide range of vegetation and surface pattern types (pool systems), some of which are unknown elsewhere. This range of structurally diverse peatland and freshwater habitats supports a wide variety of breeding birds including internationally important populations of raptors, wildfowl and waders.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Black-throated diver *Gavia arctica*, 26 pairs representing at least 16.3% of the breeding population in Great Britain (11 year mean, 1986-1996) [favourable maintained]

Golden eagle *Aquila chrysaetos*, 5 pairs representing at least 1.3% of the breeding population in Great Britain (Count, as at 1992) [favourable maintained]

Golden plover *Pluvialis apricaria*, 1,064 pairs representing at least 4.7% of the breeding population in Great Britain (Count, as at mid-1990s) [favourable maintained]

Hen harrier *Circus cyaneus*, 14 pairs representing at least 2.8% of the breeding population in Great Britain (5 year mean, 1993-1997) [favourable maintained]

Merlin *Falco columbarius*, 54 pairs representing at least 4.2% of the breeding population in Great Britain (Count, as at early 1990s) [favourable maintained]

Red-throated diver *Gavia stellata*, 89 pairs representing at least 9.5% of the breeding population in Great Britain (Two year mean, 1993-1994)

Short-eared owl *Asio flammeus*, 30 pairs representing at least 3.0% of the breeding population in Great Britain (Count, as at mid-1990s)

Wood sandpiper *Tringa glareola*, 5 pairs representing up to 50.0% of the breeding population in Great Britain (Two year mean, 1994-1995) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Common scoter *Melanitta nigra*, 27 pairs representing <0.1% of the breeding Western Siberia/Western & Northern Europe/Northwestern Africa population (1996) [favourable maintained]

Dunlin *Calidris alpina schinzii*, 1,860 pairs representing at least 16.9% of the breeding Baltic/UK/Ireland population (Count, as at 1994) [favourable maintained]

Greenshank *Tringa nebularia*, 256 pairs representing at least 0.4% of the breeding Europe/Western Africa population (1994/95) [favourable maintained]

Wigeon *Anas penelope*, 43 pairs representing <0.1% of the breeding Western Siberia/Northwestern/Northeastern Europe population (1994)

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: North Caithness Cliffs SPA	
Location	Grid Ref: ND182743 (central point) Latitude 58º39'00"N Longitude 03º24'30"W
Area (ha)	557.73 + 2km offshore extension
Summary	The North Caithness Cliffs SPA is located on the north coast of Caithness in northern Scotland. The site comprises most of the sea-cliff areas between Red Point and Duncansby Head on the north mainland coast, and the western cliffs on the island of Stroma. Cliff ledges, stacks and geos provide ideal nesting sites for important populations of seabirds, especially gulls and auks. The seabirds nesting on the North Caithness Cliffs feed outside the SPA in the surrounding waters of the Pentland Firth, as well as further afield. The cliffs also provide important nesting habitat for peregrine *Falco peregrinus.*

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Peregrine *Falco peregrinus*, 6 pairs representing at least 0.5% of the breeding population in Great Britain (Mid-1990s)

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Guillemot *Uria aalge*, 26,994 pairs representing at least 1.2% of the breeding East Atlantic population (Count as at 1987) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 110,000 individual seabirds including: puffin *Fratercula arctica*, razorbill *Alca torda*, kittiwake *Rissa tridactyla*, fulmar *Fulmarus glacialis*, guillemot *Uria aalge* [favourable maintained, except kittiwake and razorbill: unfavourable declining]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: North Sutherland Coastal Islands SPA	
Designation	Special Protection Area
Location	Grid Ref: NC632657 (central point) Latitude 58º33'30"N Longitude 04º21'00"W
Area (ha)	221.11
Summary	The North Sutherland Coastal Islands SPA comprises two islands off the north coast of Sutherland in northern Scotland: Eilean nan Ron off the Kyle of Tongue, and Eilean Hoan at the mouth of Loch Eriboll. These islands have a rocky coastline and are covered by maritime heath and grassland. Most of the island is covered by a range of grassland communities, although at the northwest end there is a small area of maritime heath, as well as small areas of nutrient-enriched vegetation close to colonies of breeding gulls. The islands support a traditional wintering flock of Greenland barnacle goose. The birds roost and feed on both islands, as well as on other small islands outside the SPA, and on agriculturally improved land on the nearby mainland.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **Over winter:** Barnacle goose *Branta leucopsis,* 631 individuals representing at least 2.3% of the wintering population in Great Britain (4 year peak mean, 1992/3-1995/6) [favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Cape Wrath SPA	
Designation	Special Protection Area
Location	Grid Ref: NC319715 (central point) Latitude 58º36'00"N Longitude 04º53'30"W
Area (ha)	1019.18 + 2km offshore extension
Summary	Cape Wrath lies at the north-westernmost tip of mainland Scotland in Sutherland. The site comprises two stretches of Torridonian sandstone and Lewisian gneiss cliffs (of *c*. 15km length) around the headland of Cape Wrath. These cliffs provide suitable nest sites for large numbers of breeding seabirds. West of Cape Wrath, the cliffs are broken with undercliffs vegetated by heather, juniper and ferns, whilst east of the headland, far more precipitous cliffs rise to about 200m. Cape Wrath is especially important for gulls and auks. The seabirds feed outside the SPA in the nearby waters and more distantly in the North Atlantic.
Qualifying features for which the site is designated [condition]:	
Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds ***Assemblage qualification: A seabird assemblage of international importance.*** During the breeding season, the area regularly supports 50,000 individual seabirds including: puffin *Fratercula arctica*, razorbill *Alca torda*, guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, fulmar *Fulmarus glacialis* [all favourable maintained, except puffin: unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: North Rona and Sula Sgeir SPA	
Location	Grid Ref: HW812325 (central point) Latitude 59º06'35"N Longitude 05º59'27"W
Area (ha)	138.79 + 2km offshore extension
Summary	The two small and remote islands of North Rona and Sula Sgeir lie in the North Atlantic about 65km from the island of Lewis in the Outer Hebrides. Sula Sgeir is about 15km west of the far larger North Rona. North Rona is well covered by peat or soil and is vegetated with maritime grassland. Sula Sgeir is subject to severe erosive pressure from sea spray and seabirds and has little soil or vegetation. The islands provide strategically placed nesting localities for large numbers of seabirds which feed in the waters off the north coast of Scotland away from the SPA. They hold a diverse assemblage of species including large numbers of petrels, auks, gulls and gannet. It is one of only seven known nesting localities in the EU for Leach's petrel.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:
Leach's storm-petrel *Oceanodroma leucorhoa*, 2,750 pairs representing at least 5.0% of the breeding population in Great Britain (Seabird Census Register 1986-88) [favourable maintained]

Storm petrel *Hydrobates pelagicus*, 1,000 pairs representing at least 1.2% of the breeding population in Great Britain (Seabird Census Register 1986-88) [unfavourable no change]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Gannet *Morus bassanus*, 9,000 pairs representing at least 3.4% of the breeding North Atlantic population (Seabird Census Register)

Guillemot *Uria aalge*, 28,944 pairs representing at least 1.3% of the breeding East Atlantic population (Seabird Census Register) [unfavourable recovering]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 130,000 individual seabirds including: puffin *Fratercula arctica*, razorbill *Alca torda*, kittiwake *Rissa tridactyla*, great black-backed gull *Larus marinus*, fulmar *Fulmarus glacialis*, guillemot *Uria aalge*, gannet *Morus bassanus*, leach's storm-petrel *Oceanodroma leucorhoa*, storm petrel *Hydrobates pelagicus* [all favourable maintained, except razorbill and guillemot: unfavourable recovering; and storm petrel: unfavourable no change]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: Flannan Isles SPA	
Location	Grid Ref: NA724469 (central point) Latitude 58º17'20"N Longitude 07º35'30"W
Area (ha)	58.87 + 2km offshore extension
Summary	The Flannan Isles are a group of six rocky islands with outlying skerries, which lie approximately 30km west of Lewis in the Outer Hebrides. They provide a strategically placed nesting locality for seabirds, which feed in the rich waters off the Western Isles. The vegetation of the islands is predominantly maritime grassland. The islands are an important nesting area for a variety of seabird species, especially auks, but including Leach's Petrel, for which they are one of only seven known nesting localities in the EU. The seabirds feed outside the SPA in nearby waters, as well as more distantly in the North Atlantic.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Leach's storm-petrel *Oceanodroma leucorhoa*, 100 pairs representing at least 0.2% of the breeding population in Great Britain (Count as at 1991) [favourable maintained] ***Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds*** ***Assemblage qualification: A seabird assemblage of international importance.*** During the breeding season, the area regularly supports 50,000 individual seabirds including: Leach's storm-petrel *Oceanodroma leucorhoa*, puffin *Fratercula arctica*, razorbill *Alca torda*, guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, fulmar *Fulmarus glacialis* [all favourable maintained, except guillemot, kittiwake and razorbill: unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Handa SPA	
Location	Grid Ref: NC137483 (central point) Latitude 58º23'00"N Longitude 05º11'12"W
Area (ha)	367.49 + 2km offshore extension
Summary	Handa is an island surrounded by high sea-cliffs lying a short distance from the west coast of Sutherland. It provides a strategic nesting locality for seabirds that feed in the productive waters of the northern Minch, outside the SPA. Most of the island is vegetated with sub-maritime grasslands and heaths. The SPA's principal ornithological importance is for its breeding seabirds.
Qualifying features for which the site is designated [condition]:	
Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **During the breeding season:** Guillemot *Uria aalge*, 76,105 pairs representing at least 3.4% of the breeding East Atlantic population (Count as at 1994) [favourable maintained] Razorbill *Alca torda*, 10,432 pairs representing at least 1.8% of the breeding population (Count as at 1997) [favourable maintained] ***Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds*** ***Assemblage qualification: A seabird assemblage of international importance.*** During the breeding season, the area regularly supports 200,000 individual seabirds including: kittiwake *Rissa tridactyla*, great skua *Catharacta skua*, fulmar *Fulmarus glacialis*, razorbill *Alca torda*, guillemot *Uria aalge* [all favourable maintained, except kittiwake: unfavourable declining]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Priest Island (Summer Isles) SPA	
Location	Grid Ref: NB925022 (central point) Latitude 57º57'40"N Longitude 05º30'30"W
Area (ha)	131.68
Summary	Priest Island is the outermost and most exposed of the Summer Isles, lying about 6km off the west coast of Wester Ross. The island rises to about 75m and supports heath communities, numerous lochs and a small amount of woodland. Enrichment from salt spray and bird guano enables more species-rich maritime heath and cliff communities to exist around the coast. Priest Island supports one of the largest storm petrel colonies in the UK, together with small numbers of other breeding seabirds. These species feed outside the SPA in surrounding and more distant marine areas.
Qualifying features for which the site is designated [condition]:	
Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** Storm petrel *Hydrobates pelagicus*, 2,200 pairs representing at least 2.6% of the breeding population in Great Britain (Count as at 1995) [favourable maintained]	
Conservation objectives:	
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Shiant Isles SPA	
Location	Grid Ref: NG413984 (central point) Latitude 57º54'00"N Longitude 06º22'00"W
Area (ha)	212.33 + 2km offshore extension
Summary	The Shiant Isles are a small island group lying in the Minch east of the Outer Hebrides. The site comprises three large islands and several small islands and skerries, lying about 6km east of Lewis. The islands are composed mainly of a basaltic sill and include various types of coastline, including sheer cliffs and boulder screes, both of which provide suitable nesting sites for seabirds. In summer, the Shiants are important for breeding seabirds, especially auks and fulmar. In winter, the close-cropped turf of the islands supports a flock of Greenland barnacle goose. The seabirds feed outside the SPA in nearby waters, as well as more distantly elsewhere in the Minch.

Qualifying features for which the site is designated [condition]:

Under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

Over-winter:
Barnacle goose *Branta leucopsis,* 172 individuals representing at least 0.6% of the wintering population in Great Britain (Three count mean, 1994, 1995 & 1997) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

During the breeding season:
Puffin *Fratercula arctica*, 76,100 pairs representing at least 8.4% of the breeding population (Count as at 1970) [favourable maintained]

Razorbill *Alca torda*, 7,337 pairs representing at least 1.3% of the breeding population (Count as at 1986) [favourable maintained]

Shag *Phalacrocorax aristotelis*, 1,780 pairs representing at least 1.4% of the breeding Northern Europe population (Count as at 1986) [favourable maintained]

Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds
Assemblage qualification: A seabird assemblage of international importance.

During the breeding season, the area regularly supports 200,000 individual seabirds including: guillemot *Uria aalge*, kittiwake *Rissa tridactyla*, fulmar *Fulmarus glacialis*, puffin *Fratercula arctica*, razorbill *Alca torda*, shag *Phalacrocorax aristotelis* [all favourable maintained]

Conservation objectives:

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

C2 Coastal and Marine Special Areas of Conservation

Site Name: Sullom Voe SAC	
Location	Grid Ref: HU380757 (central point) Latitude 60º 27'50"N Longitude 01º 18'35"W
Area (ha)	1698.55
Summary	Lying in Shetland, this Sullom Voe SAC is the most northerly site in the UK selected as representative of large shallow inlets and bays. The boreal-arctic species-rich communities present are restricted to Shetland. The intertidal, muddy and coarser sublittoral sediments present support several diverse faunal communities, including a range of bivalves, polychaetes and amphipods. Horse mussels and sea-pens are present on the muddy sublittoral areas.
Qualifying features for which the site is designated [condition]:	
Annex 1 Habitat Primary feature: Large shallow inlets and bays [favourable maintained] Secondary features: Coastal lagoons [favourable maintained], reefs [favourable maintained] **Annex 2 Species** Primary features: None Secondary features: None	
Conservation objectives:	
For Annex I Habitats To avoid deterioration of the qualifying habitats (listed above), thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying habitats that the following are maintained in the long term: • Extent of the habitats on site • Distribution of the habitats within site • Structure and function of the habitats • Processes supporting the habitats • Distribution of typical species of the habitats • Viability of typical species as components of the habitats • No significant disturbance of typical species of the habitats	
For Annex II Species • N/A	

Site Name: Yell Sound Coast SAC	
Location	Grid Ref: HU467755 (central point) Latitude 60º 27'40"N Longitude 01º 09'00"W
Area (ha)	1540.55
Summary	The site lies in Sheltand, between the north mainland and Yell, and consists of a complex of low-lying and peaty islands and coastline with easy access to fresh water. The Yell Sounds area has the highest density of otters in Shetland and the site is believed to support over 2% of the population of Great Britain. Distinct from their mainland counterparts, Shetland otters are the most intensely studied and possibly densest populations in Europe. Adjacent marine areas have extensive algal beds which are used for foraging. The rocky shores and uninhabited islands of the sound also support important numbers of common seal (over 1% UK population), and represent the most northerly site selected for this feature in the UK.
Qualifying features for which the site is designated [condition]:	
Annex 1 Habitat Primary feature: None Secondary features: None **Annex 2 Species** Primary features: Otter *Lutra lutra* [favourable maintained], common seal *Phoca vitulina* [favourable maintained] Secondary features: None	
Conservation objectives:	
For Annex I Habitats N/A	
For Annex II Species To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within the site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Mousa SAC	
Location	Grid Ref: HU462241 (central point) Latitude 60º 00'00"N Longitude 01º 10'20"W
Area (ha)	530.6
Summary	Mousa is an exposed rocky island off the east coast of the Shetland mainland. It supports one of the largest groups of common seal in Shetland and is one of the most northerly groups in the UK. The large rocky tidal pools on the island are of particular importance, as they are frequently used by the seals for pupping, breeding and moulting, and provide shelter from the exposed conditions on the open coast. The site supports just over 1% of the UK population.

Qualifying features for which the site is designated [condition]:

Annex 1 Habitat
Primary feature: None
Secondary features: Reefs [favourable maintained], submerged or partially submerged sea caves [favourable maintained]

Annex 2 Species
Primary features: Common seal *Phoca vitulina* [unfavourable declining]
Secondary features: None

Conservation objectives:

For Annex I Habitats
To avoid deterioration of the qualifying habitats (listed above), thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying habitats that the following are maintained in the long term:

- Extent of the habitats on site
- Distribution of the habitats within site
- Structure and function of the habitats
- Processes supporting the habitats
- Distribution of typical species of the habitats
- Viability of typical species as components of the habitats
- No significant disturbance of typical species of the habitats

For Annex II Species
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within the site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: Faray and Holm of Faray SAC	
Location	Grid Ref: HY529378 (central point) Latitude 59º 13'30"N Longitude 02º 49'30"W
Area (ha)	785.68
Summary	These two uninhabited islands in the northern part of Orkney support a well-established breeding colony of grey seal. The seals tend to be found in areas where there is easy access from the shore, and freshwater pools on the islands appear to be particularly important. The islands support the second-largest breeding colony in the UK, contributing around 9% of annual UK pup production.
Qualifying features for which the site is designated [condition]:	
Annex 1 Habitat Primary feature: None Secondary features: None **Annex 2 Species** Primary features: Grey seal *Halichoerus grypus* [favourable maintained] Secondary features: None	
Conservation objectives:	
For Annex I Habitats N/A	
For Annex II Species To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within the site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

Site Name: Sanday SAC	
Location	Grid Ref: HY715442 (central point) Latitude 59º 17'00"N Longitude 02º 30'00"W
Area (ha)	10971.65
Summary	Sanday is a large, low-lying island in the north-east of the Orkney archipelago. Surrounded by clear, relatively shallow water, the island has a complex coastline dominated by extensive sandy beaches and sheltered inlets, interspersed with rocky headlands. Sanday is notable for the extensive subtidal bedrock reefs that surround the island and provide a habitat for dense forests of kelp. The kelp occurs to a depth of about 20m and provides a habitat for species-rich, red algal turf communities, sponges, and ascidians. The kelp beds also provide important foraging areas for common seal. The seal colony is the largest at any discrete site in Scotland with the breeding groups representing over 4% of the UK population. The north coast of Sanday is tide-swept and appears to support a richer fauna than the south coast, with a dense bryozoan/hydroid turf, dense brittlestar and horse mussel beds lying in mixed sediment below the kelp zone. Crabs and brittlestars are common within crevices in the rock.

Qualifying features for which the site is designated [condition]:

Annex 1 Habitat
Primary feature: Reefs [favourable maintained]
Secondary features: Sandbanks which are slightly covered by seawater all the time, mudflats and sandflats not covered by seawater at low tide [all favourable maintained]

Annex 2 Species
Primary features: Common seal *Phoca vitulina* [favourable maintained]
Secondary features: None

Conservation objectives:

For Annex I Habitats
To avoid deterioration of the qualifying habitats (listed above), thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest.

To ensure for the qualifying habitats that the following are maintained in the long term:
- Extent of the habitats on site
- Distribution of the habitats within site
- Structure and function of the habitats
- Processes supporting the habitats
- Distribution of typical species of the habitats
- Viability of typical species as components of the habitats
- No significant disturbance of typical species of the habitats

For Annex II Species
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term:
- Population of the species as a viable component of the site
- Distribution of the species within the site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Site Name: River Borgie SAC	
Location	Grid Ref: NC666582 (central point) Latitude 58º 29'30"N Longitude 04º 17'20"W
Area (ha)	32.72
Summary	With the River Naver, this site in Sutherland represents the northern extreme for freshwater pearl mussel in the UK. Freshwater habitats predominate, although the site also contains tidal stretches, estuarine habitat, mud and sandflats and lagoons. Pearl mussels have been recorded throughout much of the length of the river (although most abundant in middle reaches), indicating that they can support good populations, despite a history of relatively intensive pearl-fishing. Both rivers support high quality pearl mussel populations that include many juveniles, indicating recent successful recruitment. The site supports an Atlantic salmon population which, along with the Rivers Naver and Thurso, is representative of the northerly part of the species' range in the UK.

Qualifying features for which the site is designated [condition]:

Annex 1 Habitat
Primary features: None
Secondary features: None

Annex 2 Species
Primary features: Freshwater pearl mussel *Margaritifera margaritifera* [favourable maintained],
Secondary features: Atlantic salmon *Salmo salar* [unfavourable recovering], otter [favourable maintained]

Conservation objectives:

For Annex II Species
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within the site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of species

Durness SAC	
Location	Grid Ref: NC390679 (central point) Latitude 58º 34'09"N Longitude 04º 46'06"W
Area (ha)	1212.74
Summary	Durness contains one of the largest sand dune systems in the north of Scotland, and is an example of an extreme northern variant of fixed dunes with herbaceous vegetation. The site is maintained by very active physical and biological processes. Fixed dune vegetation at this site occurs on an extensive and diverse sequence of dunes and on soils covered with blown sand. A rich variety of calcareous dune grassland species grow here in association with arctic-alpine plants such as mountain avens. Durness contains a cluster of three marl lochs, which are the northernmost examples of marl lakes in the UK and one of the few high-quality occurrences of the habitat type in Scotland. Borralie is the only marl lake in the UK with a population of Arctic charr. Durness contains the largest stands of *Dryas octopetala – Carex flacca* heath in the UK and has an outstanding representation of characteristic species, including wild thyme, ribwort plantain, sea plantain, purging flax and common bird's-foot-trefoil. There are transitions to a wide range of other communities, including coastal dunes, other types of base-rich grasslands, and a range of dwarf-shrub heaths. This site on Cambro–Ordovician Durness limestone is the most north-westerly occurrence of limestone pavements in the UK; it is one of five sites representing the northern variant of this habitat type.

Qualifying features for which the site is designated:

Annex 1 Habitat

Primary features: Fixed dunes with herbaceous vegetation [unfavourable no change], limestone pavements [unfavourable declining], hard oligotrophic waters with benthic vegetation of *Chara* spp. [favourable maintained], Alpine and sub-Alpine calcareous grasslands [unfavourable no change]

Secondary features: Shifting dunes with *Ammophila arenaria* [favourable maintained], humid dune slacks [unfavourable no change], wet heaths with *Erica tetralix* [unfavourable no change], European dry heaths [unfavourable no change], hydrophilous tall herb fringe communities of plains and of montane to Alpine levels [favourable maintained], alkaline fens [unfavourable no change]

Annex 2 Species

Primary features: None

Secondary features: Otter *Lutra lutra*

Conservation objectives:

For Annex I Habitats

To avoid deterioration of the qualifying habitat (listed above) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying habitat that the following are maintained in the long term:

- Extent of the habitat on site
- Distribution of the habitat within site
- Structure and function of the habitat
- Processes supporting the habitat
- Distribution of typical species of the habitat
- Viability of typical species as components of the habitat
- No significant disturbance of typical species of the habitat

For Annex II Species

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within the site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of species

North Rona SAC	
Location	Grid Ref: HW811327 (central point) Latitude 59º 07'30"N Longitude 05º 49'30"W
Area (ha)	628.53
Summary	North Rona is a remote and very exposed island in the North Atlantic off the north-west tip of Scotland. The islands are rarely disturbed by human activities in the breeding season. Grey seal are found over much of the island and use many of the submerged sea caves that are found around the coast. North Rona supports the third-largest breeding colony in the UK, representing some 5% of annual UK pup production. The seals forage widely throughout waters adjacent to the SAC and beyond.

Qualifying features for which the site is designated [condition]:

Annex 1 Habitat
Primary features: None
Secondary features: Reefs, vegetated cliffs of the Atlantic and Baltic coasts, submerged or partially submerged sea caves

Annex 2 Species
Primary features: Grey seal *Halichoerus grypus* [favourable maintained]
Secondary features: None

Conservation objectives:

For Annex I Habitats
To avoid deterioration of the qualifying habitat (listed above) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying habitat that the following are maintained in the long term:

- Extent of the habitat on site
- Distribution of the habitat within site
- Structure and function of the habitat
- Processes supporting the habitat
- Distribution of typical species of the habitat
- Viability of typical species as components of the habitat
- No significant disturbance of typical species of the habitat

For Annex II Species
To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within the site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of species

Site Name: Loch Laxford SAC	
Location	Grid Ref: NC198501 (central point) Latitude 58º 24'08"N Longitude 05º 05'05"W
Area (ha)	1221.33
Summary	Loch Laxford, on the west coast of Scotland, is a complex fjard with numerous small islands and side branches that include two subsidiary lochs. It is an excellent example of large shallow inlets and bays and contains a wide variety of marine habitats and communities. The outermost part of the site is very exposed, but the many reefs and islands near to the narrow loch entrance result in sheltered conditions over most of the loch. The most important area for sediments, a sheltered littoral inlet at the head of the loch, contains the only extensive sheltered sediment shore in the northern part of the west coast. The soft muds of the inner subsidiary loch, Loch a'Chadh-Fi, contain particularly dense beds of the anemone *Sagartiogeton laceratus*, and the snake blenny (which usually occurs in burrows in deeper water) is also common here. In the outer more exposed reaches of the site, coarser sediments predominate supporting sea cucumbers, hydroids, heart-urchins and bivalves. Beds of maerl, with their associated species-rich communities, also occur in various channels of the loch.
Qualifying features for which the site is designated [condition]:	
Annex 1 Habitat Primary features: Large shallow inlets and bays [favourable maintained] Secondary features: Reefs [favourable maintained] ***Annex 2 Species*** Primary features: None Secondary features: None	
Conservation objectives:	
For Annex I Habitats To avoid deterioration of the qualifying habitat (listed above) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying habitat that the following are maintained in the long term: • Extent of the habitat on site • Distribution of the habitat within site • Structure and function of the habitat • Processes supporting the habitat • Distribution of typical species of the habitat • Viability of typical species as components of the habitat • No significant disturbance of typical species of the habitat	

Site Name: Ascrib, Isay and Dunvegan SAC	
Location	Grid Ref: NG222565 (central point) Latitude 57º 30'50"N Longitude 06º 38'20"W
Area (ha)	2584.99
Summary	The complex of skerries, islets, undisturbed mainland shores and offshore islands in northwest Skye consistently support a breeding colony of the common seal. The site represents one of the larger discrete colonies of common seals in the UK, holding around 2% of the UK population.
Qualifying features for which the site is designated [condition]:	
Annex 1 Habitat Primary feature: None Secondary features: None **Annex 2 Species** Primary features: Common seal *Phoca vitulina* [favourable maintained] Secondary features: None	
Conservation objectives:	
For Annex I Habitats N/A	
For Annex II Species To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within the site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species	

C3 Offshore Special Areas of Conservation

Site Name: Wyville Thomson Ridge possible SAC	
Location	Latitude 59º 58'25"N Longitude 06º 42'54"W
Area (ha)	173995
Summary	A rock ridge situated in the Atlantic Ocean at the northern end of the Rockall Trough. It is approximately 20km wide and 70km long and rises from over 1000m depth to less than 400m at the summit. The ridge is composed of extensive areas of stony reef interspersed with gravel areas and bedrock reef along the flanks. The stony reef is thought to have been formed by the ploughing movement of icebergs through the seabed at the end of the last ice age. These ploughmarks consist of ridges of boulders, cobbles and gravel where finer sediments have been winnowed away by high energy currents at the site, interspersed with finer sediment troughs up to 5m-10m deep (Masson *et al*. 2000). The rock and stony reef areas support diverse biological communities representative of hard substratum in deep water. Communities on the bedrock reef vary in species composition between the two sides of the ridge due to the influences of different water masses (Howell *et al*. Unpublished) - the ridge divides the relatively warm water of the Rockall Trough from the cold water of the Faroe-Shetland Channel. This combination of water masses in one area is unique in UK waters. The Wyville Thomson Ridge is located on the Scottish continental shelf edge approximately 150km northwest of Cape Wrath; it extends in a northwesterly direction towards the Faeroe Bank. Data collected since 1997 confirm that bottlenose dolphins may occur seasonally (autumn/winter) in deep water along the Wyville Thomson Ridge (Pollock *et al.* 2000); JNCC have recommended that the species be listed as a non-significant presence within the site.
Qualifying features for which the site is designated:	
Annex 1 Habitat Interest features: Reefs ***Annex 2 Species*** Interest features: None	
Conservation objectives:	
For Habitats and Species Subject to natural change, maintain the reefs in favourable condition, such that: • The natural environmental and ecological processes of the reefs are maintained. • The extent, distribution, diversity and characteristic species composition of biological communities representative of stony and bedrock reef within the Scottish continental shelf and Faroe-Shetland Channel are maintained.	

Site Name: Darwin Mounds candidate SAC	
Location	Latitude 59º 45'30"N Longitude 07º 30'00"W
Area (ha)	137726
Summary	An extensive area of sandy mounds formed by seabed fluid expulsion, each of which is capped with multiple thickets of the cold-water coral *Lophelia pertusa*. The number of thickets vary per mound and may be between one and several metres wide and high. Hundreds of mounds lie within the site but two particularly dense fields of mounds are present to the northeast and northwest limit of the area (Bett 2001). Each of the mounds is approximately 100m in diameter and 5m high, and distinguished by a 'tail' feature visible on sidescan sonar. The mounds support significant populations of the xenophyophore *Syringammina fragilissima* that is widespread in deep waters, but occurs in particularly high densities on the mounds and the tails (Bett 2001). The occurrence of *Lophelia pertusa* reef as thickets capping sandy mounds is believed to be unique (Masson *et al*. 2003). The individual reefs on each mound provide a habitat for various species of larger invertebrates such as sponges and brisingiid starfish. The Darwin Mounds lie at the north end of the Rockall Trough at a depth of approximately 1000m. They lie approximately 160km northwest of Cape Wrath on the northwest Scottish mainland.
Qualifying features for which the site is designated:	
Annex 1 Habitat Interest features: Reefs ***Annex 2 Species*** Interest features: None	
Conservation objectives:	
For Annex I Habitats Subject to natural change, maintain the Reefs in favourable condition, such that: • The natural environmental and ecological processes of the reefs are maintained. • The extent, distribution, diversity and characteristic species composition of biological communities representative of Lophelia pertusa biogenic reef in the Rockall Trough & Bank and Scottish continental shelf are maintained.	

C4 Riverine Special Areas of Conservation

Site Name: River Thurso SAC	
Location	Grid Ref: ND142490 (central point) Latitude 58º 25'20"N Longitude 03º 28'00"W
Area (ha)	355.58
Summary	The River Thurso drains a moderately large peatland catchment in Caithness and flows north through a short section of agricultural land before entering the Pentland Firth at the town of Thurso. The river supports a higher proportion of multi sea-winter Atlantic salmon than is found in many rivers further south in the species' range. This is aided by the northerly location of the river and the cooler ambient water temperature, resulting in slower-growing juveniles which smolt at an older age, and return as older multi sea-winter salmon. In addition to these multi sea-winter fish, grilse also return to the River Thurso, meaning that the river supports the full range of salmon life-history types.
Qualifying features for which the site is designated [condition]:	
Annex 1 Habitat Primary features: None Secondary features: None ***Annex 2 Species*** Primary features: Atlantic salmon *Salmo salar* [unfavourable recovering] Secondary features: None	
Conservation objectives:	
For Annex II Species To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within the site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of species	

Site Name: River Naver SAC	
Location	Grid Ref: ND629375 (central point) Latitude 58º 18'25"N Longitude 04º 20'30"W
Area (ha)	1066.66
Summary	With the River Borgie, this site in Sutherland represents the northern extreme for freshwater pearl mussel in the UK. The Mallart River is a tributary of the River Naver and they flow through a wide floodplain of moorland and conifer plantations. Both rivers support high quality pearl mussel populations that include many juveniles, indicating recent successful recruitment. Pearl mussels have been recorded throughout much of the length of both rivers, indicating that they can support good populations, despite a history of relatively intensive pearl-fishing. The River Naver and its major tributary, the Mallart, flow from a large peatland catchment northwards to its mouth on the north coast of Scotland. The site supports a high-quality Atlantic salmon population and, along with the Rivers Borgie and Thurso, is representative of the northerly part of the species' range in the UK. The northern location of the River Naver and the cooler ambient water temperature results in the Atlantic salmon producing a higher proportion of slower-growing parr which smolt at an older age. These fish often return as multi sea-winter salmon (which have spent more than one year at sea). The full range of Atlantic salmon life-history types return to the system, with grilse, spring and summer salmon all being present. The site also scores highly for being relatively free from flow modifications, allowing unhindered migration.
Qualifying features for which the site is designated [condition]:	
Annex 1 Habitat Primary features: None Secondary features: None ***Annex 2 Species*** Primary features: Freshwater pearl mussel *Margaritifera margaritifera* [unfavourable no change], Atlantic salmon *Salmo salar* [unfavourable recovering] Secondary features: None	
Conservation objectives:	
For Annex II Species To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest. To ensure for the qualifying species that the following are established then maintained in the long term: • Population of the species as a viable component of the site • Distribution of the species within the site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of species	