DEPARTMENT OF ENERGY & CLIMATE CHANGE

Offshore Oil & Gas Licensing

26th Seaward Round

Northern Ireland

Blocks 125/18, 125/19, 125/20, 125/23, 125/24 and 125/25

Appropriate Assessment

URN 11D/905: November 2011

CONTENTS

1 Introduction

1.1 Background and purpose

On 27th January 2010, the Secretary of State for the Department of Energy and Climate Change (DECC) invited applications for licences in the 26th Seaward Licensing Round.

To comply with obligations under the *Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001* (as amended) (OPAR 2001), in summer 2010, 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 2010).

In so doing, the amplification of the Habitats Directive test provided by the European Court of Justice in the Waddenzee case (Case C-127/02) was used, 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 99 whole or part 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 Appropriate Assessments (AA) in respect of each potential licence award, are contained in seven regional reports as follows:

- Southern North Sea
- Outer Moray Firth
- Central North Sea
- Fair Isle Channel
- Northern Ireland
- Eastern Irish Sea
- Central English Channel

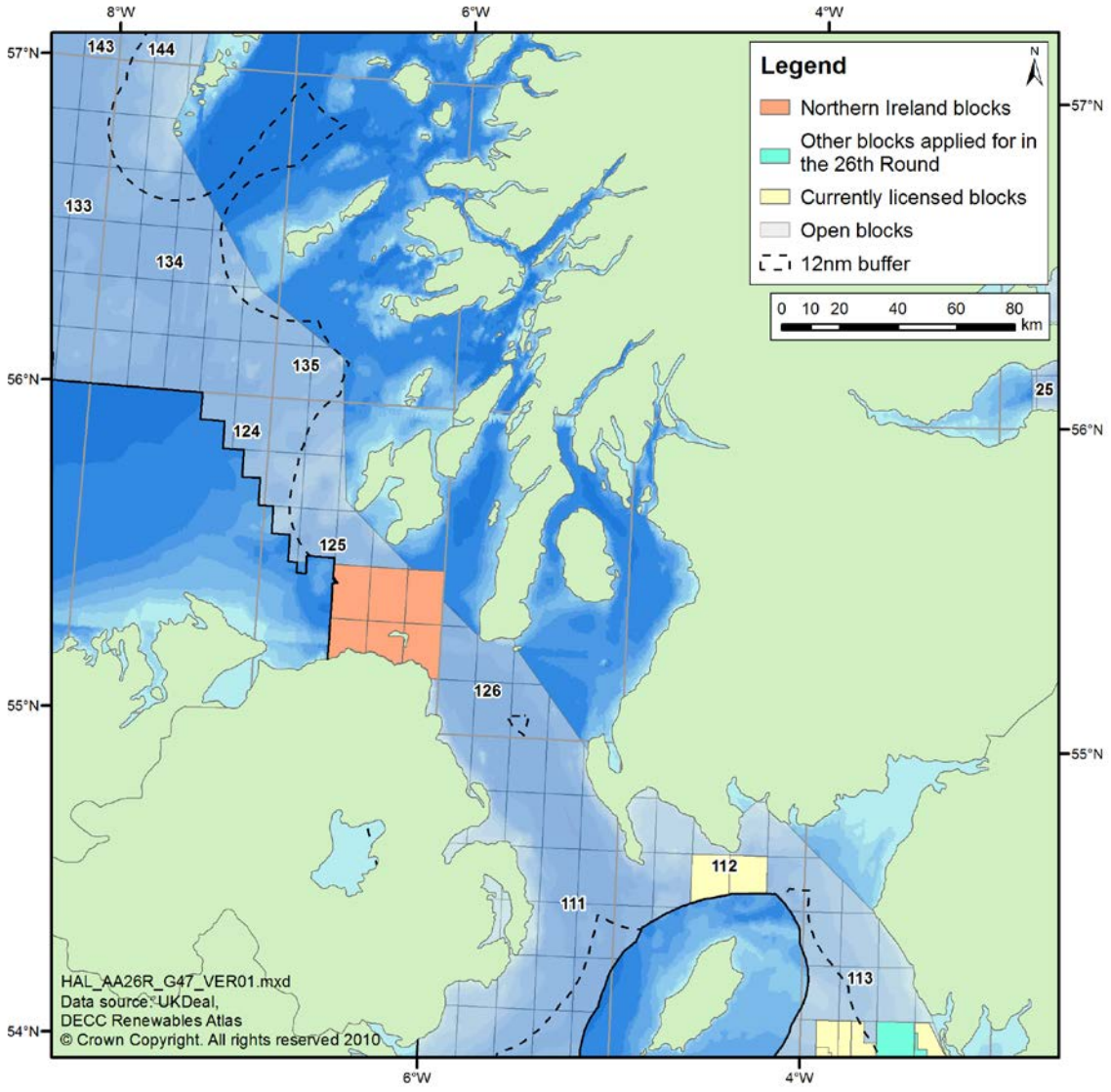
This report documents the further assessment in relation to 6 Blocks off Northern Ireland (see Section 1.2).

1.2 Northern Ireland Blocks

The Northern Ireland Blocks applied for in the 26th Round considered in this document are listed below and shown in dark orange in Figure 1.1.

125/18
125/19
125/20
125/23
125/24
125/25

Figure 1.1: Location of Northern Ireland Blocks



2 Licensing and activity

2.1 Licensing

The exclusive rights to search and bore for and get petroleum in Great Britain, the territorial sea adjacent to the United Kingdom and on the UK Continental Shelf (UKCS) are vested in the Crown and the *Petroleum Act 1998* (as amended) gives the Secretary of State the power to grant licences to explore for and exploit these resources. The main type of offshore Licence is the Seaward Production Licence. Offshore licensing for oil and gas exploration and production commenced in 1964 and has progressed through a series of Seaward Licensing Rounds. A Seaward Production Licence may cover the whole or part of a specified Block or a group of Blocks. A Licence grants exclusive rights to the holders "to search and bore for, and get, petroleum" in the area covered by the Licence. A Licence does not confer any exemption from other legal/regulatory/fiscal requirements.

There are three types of Seaward Production Licences:

- Traditional Production Licences are the standard type of Seaward Production Licences and run for three successive periods or Terms. Each Licence expires automatically at the end of each Term, unless the licensee has made enough progress to earn the chance to move into the next Term. The Initial Term lasts for four years and the Licence will only continue into a Second Term of four years if the agreed Work Programme has been completed and if 50% of the acreage has been relinquished. The Licence will only continue into a Third Term of 18 years if a development plan has been approved, and all the acreage outside that development has been relinquished.

- Frontier Production Licences are a variation of the Traditional Production Licence with longer terms. A Frontier Production Licence has a longer Initial Term (six years as opposed to four) with the objective of allowing companies to screen larger areas. After 3 years, the licensee must relinquish 75% of the licensed acreage. At the end of the Initial Term, the exploration Work Programme must have been completed and the licensee must relinquish, 50% of what is left (i.e. leaving one eighth of the original licensed area).

- In the 21st Round (2002) the Department introduced Promote Licences. The general concept of the Promote Licence is that the licensee is given two years after award to attract the technical, environmental and financial capacity to complete an agreed Work Programme. In effect, DECC will defer (not waive) its financial, technical and environmental checks until the preset Check Point. Promote licensees are not allowed to carry out field operations until they have met the full competence criteria. The way this is implemented is that each Promote Licence carries a "Drill-or-Drop" Initial Term Work Programme. The Licence will therefore expire after two years if the licensee has not made a firm commitment to DECC to complete the Work Programme (e.g. to drill a well). By the same point, it must also have satisfied DECC of its technical, environmental and financial capacity to do so.

The model clauses and terms and conditions which are attached to Licences are contained in Regulations.

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

2.2 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 a conditional commitment with the proviso, discussed above, that the licence is relinquished if a well is not drilled.

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

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 proposed work programmes for the first four-year period (six years in the case of Frontier licences) are detailed in the licence applications. For some activities, such as seismic survey noise and oil spills, the impacts can occur some distance from the licensed Blocks and the degree of activity is not necessarily proportional to the size or number of Blocks in an area. For the case of direct physical disturbance, the licence Blocks being applied for are relevant, although there may still be pipelines that cross unlicensed Blocks should any significant development ensue after the initial four-year exploratory period.

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 Blocks comprising individual licences and estimates of work commitments for the Blocks derived by DECC from the range of applications received are as follows:

- 125/18, 125/19, 125/20, 125/23, 125/24, 125/25 - Drill or drop well

On past experience, less activity actually takes place than is bid at the licence application stage. A proportion of Blocks awarded may be relinquished without any field activities occurring.

Activity after the initial term is much harder to predict, as this depends on the results of the initial phase, which is, by definition, exploratory. Typically less than half the wells drilled reveal hydrocarbons, and of that half, less than half again will yield an amount significant enough to warrant development. Depending on the expected size of finds, there may be further drilling to appraise the hydrocarbons (appraisal wells). 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. There is no existing oil and gas infrastructure within the Northern Ireland Blocks so new production facilities would likely be required to facilitate any future production from the Blocks.

The extent and timescale of development, if any, which may ultimately result from the licensing of these Blocks is therefore uncertain and would be subject to further, project level assessment (incorporating HRA where appropriate) prior to any consent being issued.

DECC has issued guidance on Block specific issues and concerns and these concerns will affect DECC's decision whether or not to approve particular activities. The guidance indicates seasonal concerns for the majority of the Blocks considered in this assessment (see Table 2.1 and Section 7.1).

Table 2.1: Seasonal and other concerns related to Blocks considered in this Appropriate Assessment

Block	Period of concern for seismic surveys	Period of concern for drilling	Spawning sites*	Special Conditions†
125/18	August - September	-	-	✓
125/19	-	-	-	✓
125/20	-	-	-	✓
125/23	August - September	-	✓	✓
125/24	August - September	-	-	✓
125/25	August - September	-	-	✓

*Note: * seabed surveys should be undertaken before any drilling activity to confirm whether there are any herring spawning sites within a three-nautical mile radius of the proposed drilling location, † Activity is of concern to the MoD because the Block lies within training ranges. For further information see: Other regulatory issues (DECC 26th Seaward licensing Round website).*

3 Relevant Natura 2000 Sites

The Natura 2000 sites to be considered in this assessment were identified based on their location in relation to the 6 Blocks (see Section 1.2 above) which are the subject of licence applications and in terms of the foreseeable possibility of interactions. Sites considered include designated Natura 2000 sites (also referred to as 'European Sites') and potential sites for which there is adequate information on which to base an assessment.

The sites considered are listed and mapped in Appendix A, and Appendix B presents the results of a screening exercise of these sites to identify the potential effects of activities that could follow the licensing of the 6 Blocks in question. In accordance with Government policy (as set out in Planning Policy Statement 9 (ODPM 2005a[1])), the relevant sites considered include classified and potential SPAs, designated and candidate SACs and Sites of Community Importance[2] (SCIs). 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.*"

The relevant sites are detailed in Appendix A and include:

- Coastal and marine Natura 2000 sites along the coast of Northern Ireland, the west coast of Scotland and England from the islands of Canna and Sanday to Morecambe Bay, and along the Republic of Ireland's north Donegal coast (there will most likely be a requirement to consult with relevant Irish authorities during the project-level consenting process)
- Riverine SACs within the area for migratory fish.
- Offshore SACs (i.e. sites located in the UK's offshore marine area3) situated to the north west and south east of the Blocks

Information gathering is in progress to inform the potential designation of further Natura 2000 sites, for instance the work of Kober *et al.* (2010). Should further sites be established in the future, these would be considered as necessary in subsequent project specific assessments.

Summaries of sites, together with their features of interest, and location maps are given in Appendix A (Maps A.1 to A.3 and Tables A.1 to A.7). This information is summarised in Figures 3.1-3.2 and Tables 3.1-3.3, below.

[1] Which states that "Listed Ramsar sites, also as a matter of policy, should receive the same protection as designated SPAs and SACs". UK coastal Ramsar sites are typically coincident with SACs and/or SPAs.

[2] Sites of Community Importance (SCIs) are more advanced in designation than cSACs in that they have been adopted by the European Commission but not yet formally designated by the government of the relevant country.

[3] Defined (in the *Offshore Marine Conservation (Natural Habitats, & c.) Regulations, 2007 (as amended)*) as: (a) any part of the seabed and subsoil situated within the UK's Continental Shelf (the area designated under section 1(7) of the Continental Shelf Act 1964); and (b) any part of the waters within British fishery limits (except the internal waters of, and the territorial sea adjacent to, the United Kingdom, the Channel Islands and the Isle of Man).

Figure 3.1: SPAs relevant to the Northern Ireland AA

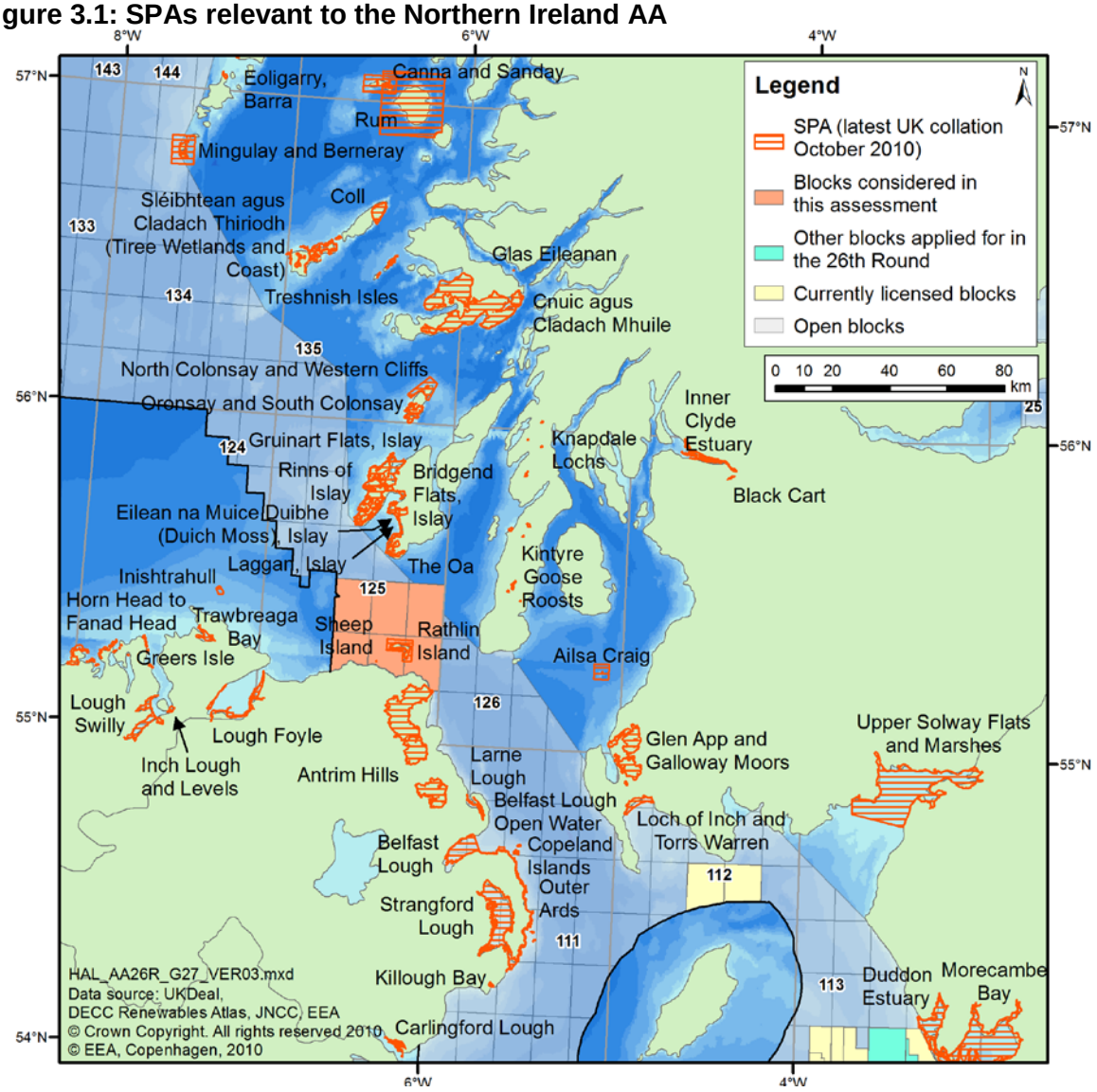


Figure 3.2: SACs relevant to the Northern Ireland AA

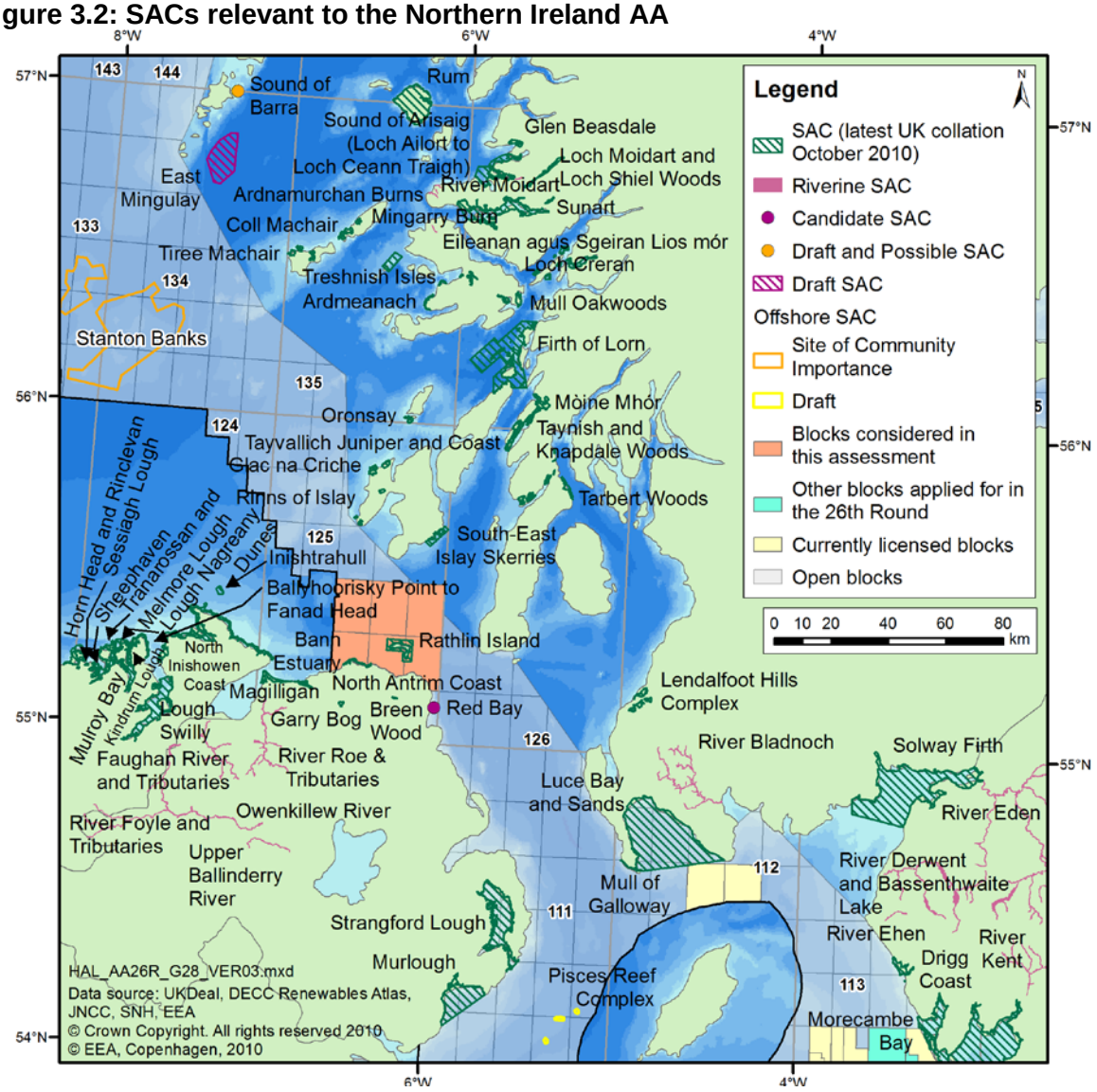


Table 3.1: SPA sites and qualifying features under Article 4.1 and 4.2, relevant to this Appropriate Assessment

	Northern Ireland												England			Adjacent member states				
	Lough Foyle	Sheep Island	Rathlin Island	Antrim Hills	Larne Lough	Belfast Lough Open Water	Belfast Lough	Copeland Islands	Outer Ards	Strangford Lough	Killough Bay	Carlingford Lough	Duddon Estuary	Morecambe Bay	Horn Head to Fanad Head	Lough Swilly	Greers Isle	Trawbreaga Bay	Inishtrahull
Great crested grebe						W										W			
Fulmar															B				B
Manx shearwater								B											
Cormorant		B													B				
Shag															B				B
Guillemot			B												B				
Razorbill			B												B				
Puffin															B				
Black-headed gull																	B		
Common gull																	B		B
Lesser black-backed gull																			B
Herring gull															B				
Great black-backed gull																			
Kittiwake			B												B				
Sandwich tern										B		B	B	B			B		
Roseate tern					B														
Common tern					B					B		B					B		
Arctic tern								B	B	B							B		
Coot															W	W			
Hen harrier				B															
Merlin				B															
Peregrine			B												B,W				
Chough															B,W				
Oystercatcher														W		W			
Ringed plover														P		W			

	Northern Ireland													England		Adjacent member states				
	Lough Foyle	Sheep Island	Rathlin Island	Antrim Hills	Larne Lough	Belfast Lough Open Water	Belfast Lough	Copeland Islands	Outer Ards	Strangford Lough	Killough Bay	Carlingford Lough	Duddon Estuary	Morecambe Bay	Horn Head to Fanad Head	Lough Swilly	Greers Isle	Trawbreaga Bay	Inishtrahull
Golden plover	W								W							W			
Grey plover														W		W			
Lapwing															B	W			
Knot										W			W	W		W			
Dunlin														W	B	W			
Snipe															B				
Black-tailed godwit																			
Bar-tailed godwit	W						W							W		W		W	
Whimbrel																			
Curlew														W		W			
Redshank							W			W			W	W		W			
Greenshank																W			
Turnstone							W							W					
Bewick's swan	W																		
Mute swan																			
Whooper swan	W														W	W		W	
Pink-footed goose														W					
Greenland white-fronted goose															W	W			
Icelandic greylag goose																			
Greenland barnacle goose															W				
Barnacle goose																		W	W
Canadian light-bellied brent goose	W				W					W	W								
Brent goose																W			
Shelduck														W		W			
Wigeon																W			
Teal															W	W			

	Northern Ireland												England		Adjacent member states				
	Lough Foyle	Sheep Island	Rathlin Island	Antrim Hills	Larne Lough	Belfast Lough Open Water	Belfast Lough	Copeland Islands	Outer Ards	Strangford Lough	Killough Bay	Carlingford Lough	Duddon Estuary	Morecambe Bay	Horn Head to Fanad Head	Lough Swilly	Greers Isle	Trawbreaga Bay	Inishtrahull
Mallard															W	W			
Pintail													W	W					
Shoveler																W			
Pochard															W	W			
Tufted duck															W	W			
Scaup																W			
Goldeneye																W			
Red-breasted merganser																W			
Common sandpiper															B				
Assemblage	W		B				W			W			W	B		W			

Note: B = Breeding, W = Over Wintering, P = On Passage, see Appendix C for more details.

See overleaf for Scotland

Table 3.1: SPA sites and qualifying features under Article 4.1 and 4.2, relevant to this Appropriate Assessment (Contd.)

	Scotland																								
	Eoligarry, Barra	Canna and Sanday	Rum	Mingulay and Berneray	Sléibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast)	Coll	Treshnish Isles	Glas Eileanan	Cnuic agus Cladach Mhuile (Mull Coast and Hills)	North Colonsay and Western Cliffs	Oronsay and South Colonsay	Gruinart Flats, Islay	Rinns of Islay	Eilean na Muice Duibhe (Duich Moss), Islay	Laggan, Islay	The Oa	Bridgend Flats, Islay	Knapdale Lochs	Kintyre Goose Roosts	Inner Clyde Estuary	Black Cart	Ailsa Craig	Glen App-Galloway Moors	Loch of Inch & Torrs Warren	Upper Solway Flats and Marshes
Red-throated diver			B																						
Black-throated diver																		B							
Fulmar				B																					
Manx shearwater			B																						
Storm petrel							B																		
Gannet																						B			
Shag				B																					
Guillemot				B																					
Razorbill				B																		B			
Lesser black-backed gull																						B			
Kittiwake				B																					
Common tern								B																	
Corncrake	B										B		B												
Hen harrier													B										B	W	
Golden eagle									R																
Chough										B, W	B, W		B			B									
Oystercatcher					B																				W
Ringed plover					B, W																				
Golden plover																									W
Grey plover																									W
Knot																									W

	Scotland																								
	Eoligarry, Barra	Canna and Sanday	Rum	Mingulay and Berneray	Sléibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast)	Coll	Treshnish Isles	Glas Eileanan	Cnuic agus Cladach Mhuile (Mull Coast and Hills)	North Colonsay and Western Cliffs	Oronsay and South Colonsay	Gruinart Flats, Islay	Rinns of Islay	Eilean na Muice Duibhe (Duich Moss), Islay	Laggan, Islay	The Oa	Bridgend Flats, Islay	Knapdale Lochs	Kintyre Goose Roosts	Inner Clyde Estuary	Black Cart	Ailsa Craig	Glen App-Galloway Moors	Loch of Inch & Torrs Warren	Upper Solway Flats and Marshes
Sanderling																									W
Dunlin					B																				W
Bar-tailed godwit																									W
Curlew																									W
Redshank					B															W					W
Turnstone					W																				W
Whooper swan													P								W				W
Pink-footed goose																									W
Greenland white-fronted goose					W	W						W	W	W	W				W					W	
Greenland barnacle goose							W																		
Svalbard barnacle goose																									
Barnacle goose					W	W						W			W		W								W
Canadian light-bellied brent goose												W													
Shelduck																									W
Teal																									W
Pintail																									W
Shoveler																									W
Scaup																									W
Common scoter													B												
Goldeneye																									W
Assemblage		B	B							B															W

Note: B = Breeding, W = Over Wintering, P = On Passage, R = Resident see Appendix C for more details.

Table 3.2: SAC sites and qualifying features under Annex 1 and Annex 2, relevant to this Appropriate Assessment

	Northern Ireland										England		Offshore				Adjacent Member States							
Annex 1 Habitats	Magilligan	Bann Estuary	North Antrim Coast	Garry Bog	Rathlin Island	Breen Wood	Red Bay SCI	Strangford Lough	Murlough	Drigg Coast	Morecambe Bay	Stanton Bank SCI	Pisces Reef Complex	Horn Head and Rinclevan	Sessiagh Lough	Sheephaven	Tranarossan and Melmore Lough	Mulroy Bay	Kindrum Lough	Ballyhoorisky Point to Fanad Head	Lough Nagreany dunes	North Inishowen Coast	Inishtrahull	Lough Swilly
Sea cliffs			P		P												P			P			P	
Sea caves					P																			
Heaths																	Q							
Bog				P		Q																		
Standing freshwater															P		P		P	Q				
Fens																								
Rocky Slopes																								
Coastal lagoons								P			Q													P
Inlets and bays								P			P							P						
Reefs					P			P			Q	P	P					P						
Sandbanks					Q		P		Q		Q													
Mudflats and sandflats								P	Q	Q	P					P,Q	Q					P		
Grasslands			Q																					
Scree																								
Coastal dunes	P,Q	P,Q	Q						P,Q	P,Q	P,Q			P		Q	P				P			
Machair														P										
Forests						P										Q								
Estuaries										P	P													P
Saltmarsh and saltmeadow		Q	Q					Q	Q	Q	P					Q								
Spartina swards																								Q
Vegetation of drift lines			Q		Q			Q									Q							
Vegetation of stony banks								Q			P						Q			Q				

	Northern Ireland									England		Offshore				Adjacent Member States								
Annex 2 Species	Magilligan	Bann Estuary	North Antrim Coast	Garry Bog	Rathlin Island	Breen Wood	Red Bay SCI	Strangford Lough	Murlough	Drigg Coast	Morecambe Bay	Stanton Bank SCI	Pisces Reef Complex	Horn Head and Rinclevan	Sessiagh Lough	Sheephaven	Tranarossan and Melmore Lough	Mulroy Bay	Kindrum Lough	Ballyhoorisky Point to Fanad Head	Lough Nagreany dunes	North Inishowen Coast	Inishtrahull	Lough Swilly
Narrow mouthed whorl snail			P																	Q				
Harbour seal								Q	Q															
Grey seal														Q										
Otter																		Q				Q		Q

Note: P = Primary feature, Q = Qualifying feature, see Appendix C for more details – note that primary and qualifying (secondary) features are treated equally within this assessment. Annex 1 habitats follow nomenclature shown in Box A.2 (AppendixA2).

See overleaf for Scotland

Table 3.2: SAC sites and qualifying features under Annex 1 and Annex 2, relevant to this Appropriate Assessment (Contd.)

	Scotland																											
Annex 1 Habitats	Sound of Barra pSAC	East Mingulay pSAC	Rum	Sound of Arisaig (Loch Ailort to Loch Ceann Traigh)	Coll Machair	Tiree Machair	Glen Beasdale	Loch Moidart and Loch Shiel Woods	Sunart	Eileanan agus Sgeiran Lios mór	Loch Creran	Treshnish Isles	Ardmeanach	Mull Oakwoods	Firth of Lorn	Moine Mhor	Taynish and Knapdale Woods	Tarbert Woods	Oronsay	Tayvallich Juniper and Coast	Glac na Criche	Rinns of Islay	South-East Islay Skerries	Lendalfoot Hills Complex	Luce Bay and Sands	Mull of Galloway	Solway Firth
Sea cliffs			Q										Q								Q					P	
Heaths			P, Q						Q												Q			Q			
Bog			Q													P					P			Q			
Standing freshwater			P		Q	P											Q										
Fens			Q																					P			
Rocky Slopes			Q																								
Inlets and Bays																									P		
Reefs		P							Q		P	Q			P										Q		Q
Sandbanks	P			P																					Q		P
Mudflats and sandflats								Q								Q									Q		P
Grasslands			P, Q										P											P, Q			
Scree			P, Q																								
Coastal dunes					P, Q	P, Q																			P		Q
Machair					P	P													P								
Forests							P	P, Q	P, Q					P		Q	P	P									
Estuaries																											P
Saltmarsh and saltmeadow																Q											P
Vegetation of stony																											Q

Annex 1 Habitats	Scotland																									
	Sound of Barra pSAC	East Mingulay pSAC	Rum	Sound of Arisaig (Loch Ailort to Loch Ceann Traigh)	Coll Machair	Tiree Machair	Glen Beasdale	Loch Moidart and Loch Shiel Woods	Sunart	Eileanan agus Sgeiran Lios mór	Loch Creran	Treshnish Isles	Ardmeanach	Mull Oakwoods	Firth of Lorn	Moine Mhor	Taynish and Knapdale Woods	Tarbert Woods	Oronsay	Tayvallich Juniper and Coast	Glac na Criche	Rinns of Islay	South-East Islay Skerries	Lendalfoot Hills Complex	Luce Bay and Sands	Mull of Galloway	Solway Firth
banks																										
Scrub (mattoral)																				P						

Annex 2 Species	Scotland																									
	Sound of Barra pSAC	East Mingulay pSAC	Rum	Sound of Arisaig (Loch Ailort to Loch Ceann Traigh)	Coll Machair	Tiree Machair	Glen Beasdale	Loch Moidart and Loch Shiel Woods	Sunart	Eileanan agus Sgeiran Lios mór	Loch Creran	Treshnish Isles	Ardmeanach	Mull Oakwoods	Firth of Lorn	Moine Mhor	Taynish and Knapdale Woods	Tarbert Woods	Oronsay	Tayvallich Juniper and Coast	Glac na Criche	Rinns of Islay	South-East Islay Skerries	Lendalfoot Hills Complex	Luce Bay and Sands	Mull of Galloway	Solway Firth
Grey seal												P														
Harbour seal										P													P			
Freshwater pearl mussel							Q																			
Otter			P				Q	Q	P					Q		Q	Q			Q							
Sea lamprey																										P

Annex 2 Species	Scotland																										
	Sound of Barra pSAC	East Mingulay pSAC	Rum	Sound of Arisaig (Loch Ailort to Loch Ceann Traigh)	Coll Machair	Tiree Machair	Glen Beasdale	Loch Moidart and Loch Shiel Woods	Sunart	Eileanan agus Sgeiran Lios mór	Loch Creran	Treshnish Isles	Ardmeanach	Mull Oakwoods	Firth of Lorn	Moine Mhor	Taynish and Knapdale Woods	Tarbert Woods	Oronsay	Tayvallich Juniper and Coast	Glac na Criche	Rinns of Islay	South-East Islay Skerries	Lendalfoot Hills Complex	Luce Bay and Sands	Mull of Galloway	Solway Firth
River lamprey																											P

Note: P = Primary feature, Q = Qualifying feature, see Appendix C for more details – note that primary and qualifying (secondary) features are treated equally within this assessment. Annex 1 habitats follow nomenclature shown in Box A.2 (AppendixA2).

Table 3.3: Species of Riverine SACs designated for migratory fish and/or the freshwater pearl mussel

	Northern Ireland					England				Scotland						AMS*
	River Faughan and Tributaries	River Foyle and Tributaries	Upper Ballinderry River	Owenkillew River	River Roe and Tributaries	River Eden	River Derwent & Bassenthwaite Lake	River Ehen	River Kent	Ardnamurchan Burns	Mingarry Burn	River Moidart	River Bladnoch	Endrick Water	River Finn
Freshwater pearl mussel			P	P				P	Q	P	P	P			
Otter	Q	Q	Q	Q	Q	P	P								P
Atlantic salmon	P	P		Q	P	P	P	Q					P	Q	P
Sea lamprey						P	P								
River lamprey						P	P							P	
Brook lamprey						P	P							P	

Note: P = Primary feature, Q = Qualifying feature, see Appendix C for more details – note that primary and qualifying (secondary) features are treated equally within this assessment.

*AMS = Adjacent Member States

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4 Assessment of the effects of the plan on site integrity

4.1 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 has:

- 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.

- Considered the comments received from statutory advisers and others on the draft AA

- Completed the AA, including DECC's conclusion on whether or not it is possible to go ahead with the plan.

In considering the above, DECC used the clarification of the tests set out in the Habitats Directive in line with the ruling of the ECJ in the *Waddenzee* case (Case C-127/02), 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 (i.e. cause deterioration to a qualifying habitat or habitat of qualifying species, and/or undermine the conservation objectives of any given site). That is the case where no reasonable scientific doubt remains as to the absence of such effects.

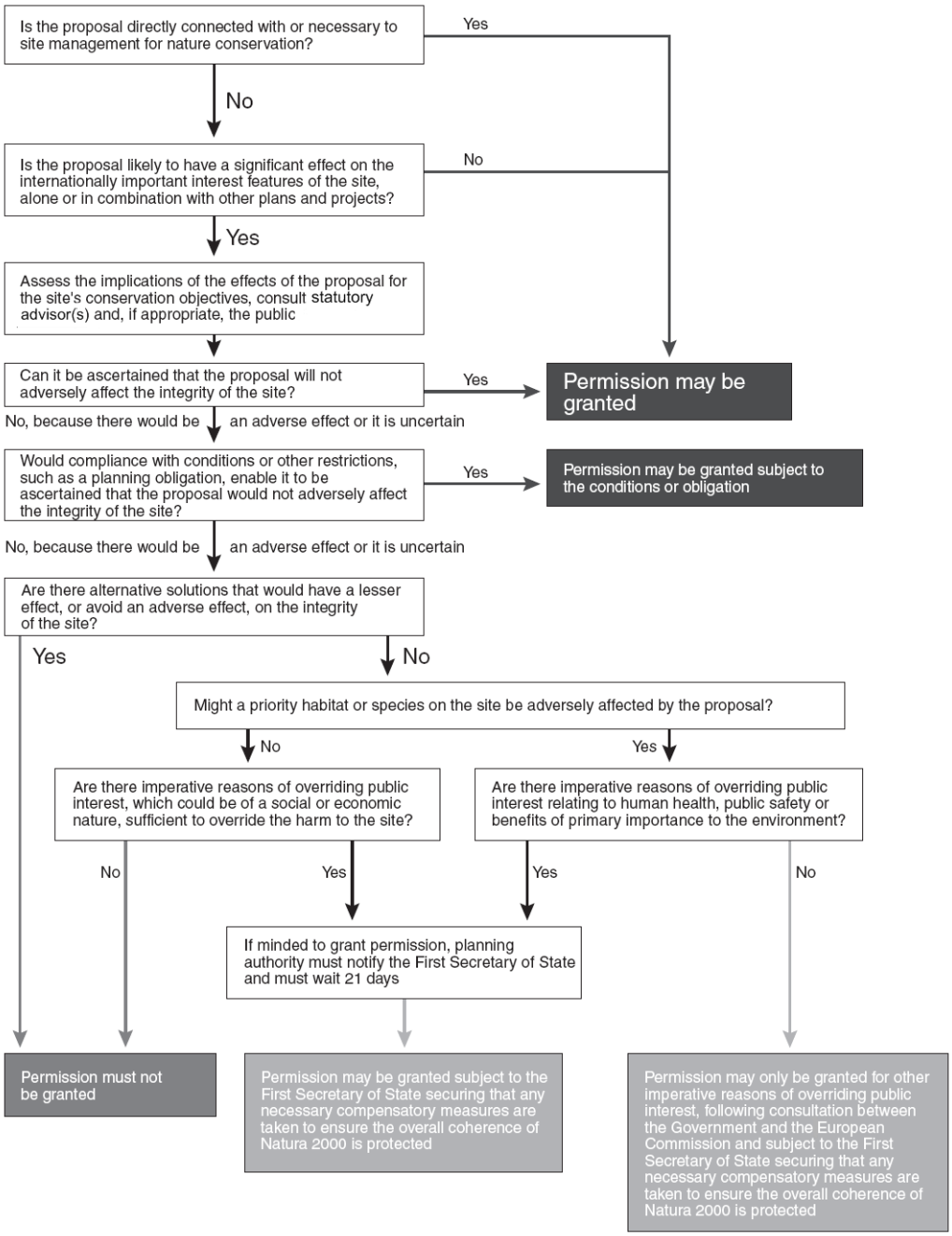
A flowchart summarising the process is shown in Figure 4.1.

4.2 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 (see Table 4.1 and Appendix B). For sites where the potential for adverse affects has been identified, their conservation objectives are listed in a site-by-site consideration in Appendix C.

Figure 4.1: 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).

4.3 Assessment

The approach to ascertaining the absence or otherwise of adverse effects on the integrity of a European Site is set out in Section 4.1 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 (e.g. SEERAD 2000), the Planning and Policy Statement note 9 (ODPM 2005a & b), the English Nature Research Reports, No 704 (Hoskin & Tyldesley 2006) and the Scottish Natural Heritage Habitats Regulations Appraisal of Plans, No 1739 (Tyldesley & Associates 2010).

Appendix A lists and summarises the relevant European Sites as defined in Section 3. Appendix B presents the results of a screening exercise of these sites to identify the potential effects of activities that could follow the licensing of the 6 Blocks in question. Where potential effects are identified, more detailed information on the relevant sites is provided in Appendix C.

Detailed assessments are made in Sections 5-8 of the implications for the integrity of the relevant European Sites and their qualifying features and species, were a licence (or licences) to be granted for the six Northern Ireland Blocks. The assessment is based on an indication of the potential work programme for the blocks and likely hydrocarbon resources (unknown but assumed to be oil as worse case in terms of potential spill impacts), 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 the Blocks; 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. Advice given under Regulation 33 (now Regulation 35 of the 2010 Regulations) 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 a requirement that these options would be evaluated in the environmental assessments required as part of activity consenting.

The conservation objectives identified for SAC and SPA features for sites where the potential for effects have been identified are listed in Appendix C and referred to where relevant throughout the document. These objectives, in relation to the specific qualifying features of each site, and the conservation status of these features, have been considered during this Appropriate Assessment. The basis and primary concern of the conservation objectives are to maintain or achieve favourable conservation status. Table 4.1 provides definition of conservation status based on Articles 1(e) and (i) of the Habitats Directive.

Table 4.1: Definition of favourable conservation status for sites defined in the Habitats Directive

For habitats	Conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species. The conservation status of a natural habitat will be taken as 'favourable' when: • its natural range and areas it covers within that range are stable or increasing • the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future • the conservation status of its typical species is favourable (see below)
For species	Conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations. The *conservation status* will be taken as 'favourable' when: • population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and • the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and • there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis

A set of high level mitigation measures have been identified with regards to each of the broad sources of effect listed above (see Table 4.2). These mitigation measures, which are discussed in more detail in sections 5-8, should *inter alia* help to avoid the deterioration of any qualifying habitats, and habitats supporting species, and seek to prevent undermining any of the conservation objectives for a given site in relation to the features for which it is designated. These high-level mitigation measures can be partly interpreted as "...conditions or other restrictions such as a planning obligation, [compliance with which would] enable it to be ascertained that the proposal would not adversely affect the integrity of the site" (see Figure 4.1, above), though also represent other non-statutory guidance etc. with regards to the avoidance of significant effects on sites. Where it is considered that no effect can arise from any of the given sources of effect for a particular species or habitat (e.g. due to animal behaviour and/or the location/characteristics of a particular habitat), certain sites may be screened out of the assessment, and these are listed in the relevant section (5-8) where this is the case (also see Appendix B).

Table 4.2: High level mitigation measures identified for potential sources of effect

	High level Mitigation
Physical disturbance	It is unlikely that any new terminals would be built as a result of developments following 26th 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 – such mitigation (e.g. pipeline route surveys) would be defined at the project level, and be subject to project specific EIA and HRA. Potential disturbance of certain species (e.g. in relation to herring spawning) may be avoided by seabed survey prior to the commencement of drilling operations. A Block for which herring spawning is a potential concern has been highlighted (See Section 2.2), and licensees should expect the occurrence of such a sensitivity to affect DECC's decision whether or not to approve particular activities.

High level Mitigation	
Marine Discharges	Discharges from offshore oil and gas facilities have been subject to increasingly stringent regulatory controls over recent decades, and oil and other contaminant concentrations in the major streams (drilling wastes and produced water) have been substantially reduced or eliminated. Discharges would be considered in detail in project-specific Environmental Statements, AAs (where necessary) and chemical risk assessments under existing permitting procedures.
Other effects	The IMO International Convention for the Control of Ballast Water and Sediment, serves to mitigate against the possible introduction of invasive alien species through shipping ballast, which may degrade sensitive local habitats and communities. Measures include the mid-ocean exchange of ballast water (with ultra-violet irradiation of ballast a proposed alternative). The potential for collision of birds with offshore infrastructure, increased by attraction of birds to lights, may be mitigated by controlling well test and routine flaring during production and by avoiding or limiting activities during months when large numbers of birds aggregate in the area.
Underwater noise	Application for consent to conduct seismic and other geophysical surveys – PON14 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). 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, *Guidelines for minimising the risk of disturbance and injury to marine mammals from seismic surveys,* are followed. European Protected Species (EPS) disturbance licences can also be issued under the *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007*. DECC will expect that passive acoustic monitoring (PAM) will be routinely used as a mitigation tool. Potential disturbance of certain species may be avoided by the seasonal timing of noisy activities, and periods of seasonal concern for individual Blocks on offer have been highlighted (See Section 2.2) for which licensees should expect to affect DECC's decision whether or not to approve particular activities.
Oil Spills	Oil Pollution Emergency Plans (OPEPs): regulatory requirements on operators to prepare spill prevention and containment measures, risk assessment and contingency planning – these are reviewed by DECC, MCA, JNCC, MMO, and relevant SNCB. Additional conditions imposed by DECC, through block-specific licence conditions (i.e. "Essential Elements"), and seasonal periods of concern for drilling, within which there is a presumption for drilling activity to be refused unless appropriate mitigation measures can be agreed (defined at the project level). Project level mitigation through permitting/HRA of specific activities (including

High level Mitigation	
	conditions attached to consents/permits or potentially consent/permit refusal). MCA is responsible for a National Contingency Plan and maintains aerial spraying and surveillance aircraft based at Coventry and Inverness and counter-pollution equipment (booms, adsorbents etc.). The MCA presently has four Emergency Towing Vessels stationed around the UK which remain on standby at sea[4].
In-combination effects	The competent authorities will assess the potential for in-combination effects during Habitats Regulations Assessments of project specific consent applications; this process will ensure that mitigation measures are put in place to ensure that subsequent to licensing, specific projects (if consented) will not result in adverse effects on integrity of European sites.

[4] The future of these vessels is presently subject to debate as a new funding stream is required for their maintenance, with the present contract to be terminated in 2011. The role of these vessels may be filled by a commercial alternative (see: http://www.parliament.uk/business/committees/committees-a-z/commons-select/transport-committee/inquiries/coastguard/).

5 Consideration of potential effects from oil spills on relevant sites

5.1 Overview of spill effects and context

Oil spills can have potentially adverse environmental effects, and are accordingly controlled by a legal framework aimed at minimising their occurrence, providing for contingency planning, response and clean up, and which enables prosecutions. It is however, not credible to conclude that in spite of the regulatory controls and other preventative measures, an oil spill will never occur as a result of 26th Round licensing.

In April 2010, a major incident occurred in the US Gulf of Mexico. During drilling of an exploratory well in deep water approximately 50 miles offshore Louisiana, there was an explosion and fire on the semi-submersible drilling rig, Deepwater Horizon. The rig was drilling in a water depth of 5,000ft with the oil reservoir at 18,000ft. UK regulators have been in contact with their counterparts in the United States (the Bureau of Ocean Energy Management, Regulation, and Enforcement - BOEMRE) to understand the cause of the incident and whether there are implications for safety at offshore operations on the UK continental shelf.

The Health and Safety Executive (HSE) is responsible for regulating the risks to health and safety arising from work in the offshore industry on the UKCS. Inspectors from HSE's Offshore Division undertake offshore inspections of well control/integrity arrangements and related safety issues, and also review well designs and procedures. In the UK a safety case regime exists with specific safeguards including:

- The *Offshore Installations (Safety Case) Regulations 2005* require written safety cases and risk assessments to be prepared by the operator, and then approved by HSE, for all mobile offshore drilling rigs operating in the UK.
- A system of well notification, where the HSE reviews well design and procedures.
- A requirement for the design and construction of a well to be examined by an independent and competent specialist.
- A scheme of independent verification of offshore safety critical equipment such as blowout preventers to ensure they are fit for purpose.
- Checks that workers involved in well operations have received suitable information, instruction, training and supervision.
- Offshore inspections of well control and integrity arrangements, and related safety issues, by specialist inspectors from HSE's Offshore Division.
- Weekly drilling reports submitted to HSE by operators.

A review has been carried out by DECC which has found that the existing system is fit for purpose, but in light of the Deepwater Horizon spill the regime is being strengthened further:

1. DECC has increased the oversight of drilling operations through the recruitment of additional inspectors in its Aberdeen office. This will allow the Department to carry out

double inspections (i.e. inspections carried out by 2 inspectors) for more complex drilling operations and it will also allow annual inspections of all mobile and fixed oil and gas installations, once all of the new inspectors are recruited and have completed relevant training.

2. In light of the Gulf of Mexico incident, DECC has reviewed the indemnity and insurance requirements for operating in the UK Continental Shelf.
3. DECC has issued letters (dated: 23rd December 2010, 21st July 2011, 20th September 2011) to all UK operators specifying a number of requirements and expectations regarding oil pollution prevention, response, emergency plans and consenting.
4. Industry trade association Oil and Gas UK established a group comprised of regulators, industry and trade union representatives (the Oil Spill Prevention and Response Advisory Group - OSPRAG) to examine the UK's strengths and weaknesses in responding to a Gulf like incident. DECC participated in this group. OSPRAG's work is documented in their final report, *Strengthening UK Prevention and Response*, published September 2011 and the Secretary of State is examining its findings closely.

As a result of the Deepwater Horizon incident a UK Parliamentary Select Committee Inquiry into the safety and environmental regulations and spill prevention and response provisions of oil and gas operations on the UKCS was held which reported in January 2011 (Energy and Climate Change Committee 2011). The report includes a series of recommendations regarding regulatory oversight, spill prevention, response and understanding. However, the Committee report did not conclude that a moratorium on drilling, even in deep water, was justified in the UK.

In January 2011 the US Government National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling released an extensive report (National Commission 2011) into the disaster, citing systematic management failures by the main companies involved and shortcomings in the US government regulatory regime as the principal sources of blame. A series of general recommendations are included in the report regarding spill prevention, response and understanding.

DECC (along with other parts of government) have considered the implications of these various findings and implemented a series of actions in response.

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 26th Round, including the recent Offshore Energy SEA2. Previous SEAs have concluded that given the UK regulatory framework and available mitigation and response, in relation to objective risk criteria (such as 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) (see Table 5.1).

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 6 Blocks in the 26th 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.

5.2 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.

The nature and extent of any hydrocarbons in the Northern Ireland Blocks is currently unknown as to date no hydrocarbons have been discovered by the limited drilling in the region. For the purposes of the consideration of the potential effects of spills, it has been assumed that any hydrocarbons from the Blocks would be oil.

5.2.1 Historical spill scenarios and frequency

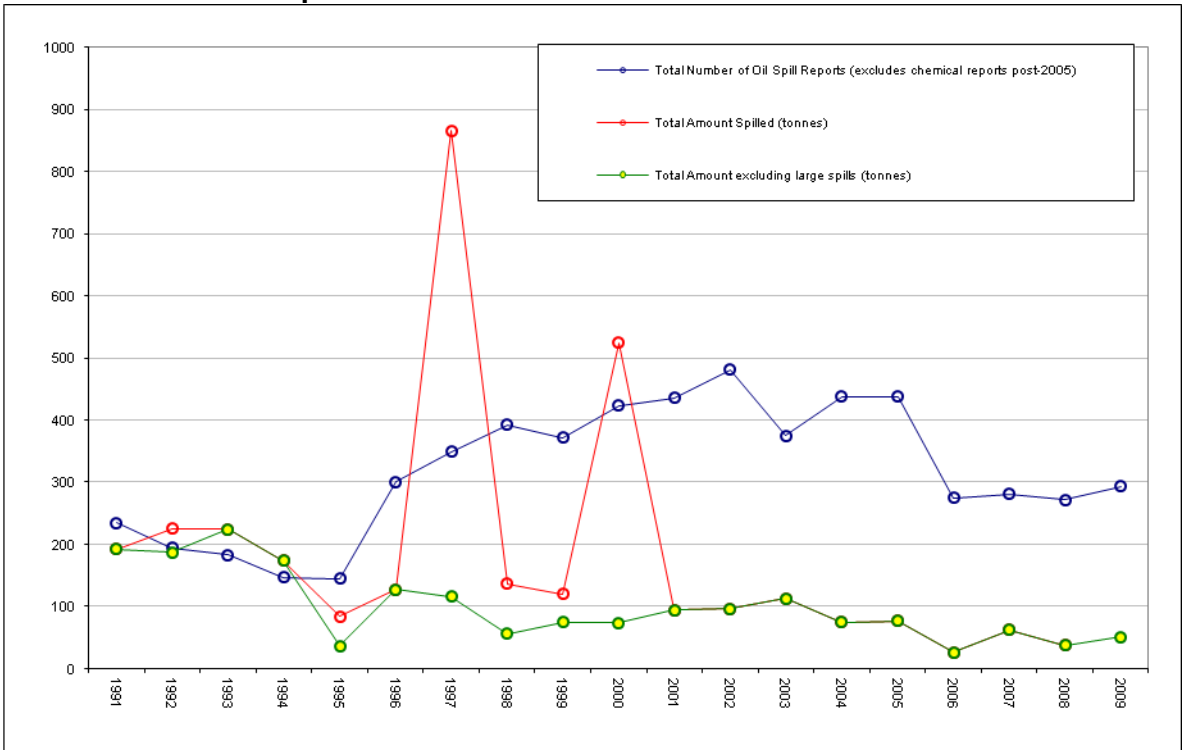
Oil spills on the UKCS have been subject to statutory reporting since 1974 under PON1 (formerly under CSON7); annual summaries of which were initially published in the "Brown Book" series, now superseded by on-line data available from the DECC website[5] (Figure 5.1). Discharges, spills and emissions data from offshore installations are also reported by OSPAR (e.g. OSPAR 2009).

DECC data indicate that the most frequent 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). Estimated spill risk from UKCS subsea facilities was equivalent to a risk of 0.003 spills/year for an individual facility, with almost all reported spills less than a tonne (<5bbl) in size.

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. A review of blowout frequencies cited in UKCS Environmental Statements as part of the OESEA2 gives occurrence values in the range 1/1,000-10,000 well-years.

[5] Oil and chemical discharge notifications (accessed October 2010) https://www.og.decc.gov.uk/information/bb_updates/chapters/Table_chart3_1.htm

Figure 5.1: Number and volume of reported oil spills from UKCS oil and gas installations over the period 1991-2009



Source: DECC website

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 as reported in Dixon 2009). This includes all spills reported by POLREP reports by the MCA and PON1 reports to DECC. The number of accidental discharges attributed to oil and gas installations during 2008 showed a reduction of 6.5% over the previous year's total. Of these discharges, 65% were fuel, lubrication or hydraulic oils; additionally, of the discharges with volume information, 95% were less than 455 litres.

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 2009 totalled 2,900 tonnes (DECC website[6]).

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, 2010).

[6] Oil discharged with produced water 2005 – 2009
https://www.og.decc.gov.uk/information/bb_updates/chapters/Table3_2.htm

5.2.2 Trajectory and fate of spilled oil

The main oil weathering processes following a surface oil spill are spreading, evaporation, dispersion, emulsification, dissolution, oxidation, sedimentation and biodegradation. The anticipated reservoir hydrocarbon type in the Northern Ireland Blocks is unknown, therefore the potential risk of spills of crude oil must be considered. 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 *ca.* 1000 tonnes would disperse naturally in about 8 hours and travel some 24km in 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. Generally, the slick front will be wind-driven on a vector equivalent to current velocity plus approximately 3% of wind velocity. Although strong winds can come from any direction and in any season, the predominant winds are from the southwest which for the Northern Ireland Blocks would push spilled oil towards the west coast of Scotland, in particular Islay and the Kintyre Peninsula. However, given the proximity of the Blocks to the Northern Ireland coast, in particular Rathlin Island, much of the coast would be potentially vulnerable to an oil spill. To support environmental assessments of individual drilling or development projects, modelling is carried out for a major crude oil release, corresponding to a blowout (i.e. a worst case scenario based on expected well flow rates and nature of the crude oil, however unlikely that scenario might be), and for smaller diesel or fuel oil releases based on the bunkering capacity of facilities, which are expected to be less persistent. Also in response to the Deepwater Horizon spill, operators are required to consider and provide evidence of planning for the eventuality that a relief well may need to be drilled (e.g. time to acquire a suitable rig, time to drill the well etc.). Representative modelling cases from various parts of the UKCS have been reviewed by successive SEAs.

5.2.3 Potential ecological effects

The most vulnerable components of the ecosystem to oil spills in offshore and coastal environments are seabirds and marine mammals, due to their close association with the sea surface. 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 (see Table 5.1 below) 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 (e.g. SPA sites with relevant qualifying species include Rathlin Island and Ailsa Craig) 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. Vulnerability is seasonal, with a general trend of high vulnerability in coastal areas adjacent to colonies during the breeding season. In winter, vulnerability in inshore waters can also be very high in some areas.

Table 5.1: Monthly seabird vulnerability to surface pollution in relevant 26th Round Blocks

Block	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Overall
125/18	2	1	2	2	1	1	1	1	2	3	2	4	1
125/19	2	1	2	3	1	1	1	1	2	3	2	-	1
125/20	2	1	2	3	1	1	1	1	1	3	1	1	1
125/23	3	1	2	4	1	1	1	1	2	3	2	-	1
125/24	3	2	2	4	1	1	1	1	2	3	2	-	2
125/25	3	2	2	3	1	1	1	1	1	2	1	1	1

Note: 1 = very high, 2 = high, 3 = moderate, 4 = low.
Source: JNCC (1999).

Fortunately, there is little experience of major oil spills in the vicinity of seabird colonies in the UK. Census of seabird colonies in southwest Wales following the *Sea Empress* spill concluded that only guillemot and razorbill populations were impacted by the spill (Baines & Earl 1998). The *Sea Empress* spill occurred in February, when seabird numbers at colonies were relatively low, but the density of wintering birds including common scoter was high. Some species, particularly puffins, Manx shearwaters and storm petrels, had not returned to the area to breed and so avoided significant impact. Around 7,000 oiled birds were washed ashore following the spill, although it is likely that the total number of birds killed was several times higher than this (SEEEC 1998). Examination of seabird corpses suggested that most died directly from oil contamination rather than, for example, food chain effects. Over 90% of the oiled birds were of three species – common scoter, guillemot and razorbill. Counts of the breeding populations confirmed the impact on guillemots and razorbills. There were 13% fewer guillemots and 7% fewer razorbills counted at breeding colonies in the area in 1996 compared with 1995, while numbers for both species increased at nearby colonies. The SEEEC (1998) report concluded that by the 1997 breeding season, numbers had recovered significantly. Banks *et al*. (2008) report the results of annual surveys of common scoter within Carmarthen Bay, an area partially affected by the spilled oil. While numbers were greatly reduced following the spill, and changes in distribution suggested the use of potentially sub-optimal foraging zones, rapid revival was observed with numbers increasing to pre-spill levels and a return to previous distributions within three winters of the event. At ten years following the incident, numbers of common scoter were not different to those recorded immediately before the spill (Banks *et al*. 2008).

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).

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 harbour seals) and particularly the pupping season (October-December in grey seals and June-July in harbour seals). Animals most at risk from oil coming ashore on seal haulout sites and breeding colonies are neonatal pups, which rely on their prenatal fur and metabolic activity to achieve thermal balance during their first few weeks of life, and are therefore more susceptible than adults to external oil contamination.

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.

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.

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 5.2, below. Generally, sheltered habitats of lower exposure to wave energy are considered most vulnerable; oil may persist for long periods in such environments.

5.3 Implications for relevant European Sites

Relevant 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:

- Oil spill probability and severity (taking into account distance from blocks under offer, and probable hydrocarbon type)
- The ecological sensitivity of the qualifying feature(s) to oil spills
- Connected with the above, in what way an oil spill would have an immediate effect on the conservation objectives of SACs and SPAs as listed in Appendix C, and any long-term implications of a spill on these objectives

It should be noted that at a project level, DECC requirements for the preparation of OPEPs and ES submissions include, amongst other mitigation and response criteria, the modelling of a worst case blowout scenario considering a specific release location, crude oil type and historic metocean conditions as well an unlikely 30 knot onshore wind, over a release time of 10 days. Detailed potential effects of an unmitigated release on Natura 2000 sites beyond a generic consideration would be considered at the project level.

5.3.1 Special Areas of Conservation

The ecological sensitivity of the qualifying features of relevant sites to oil spills varies. For several Annex I habitats and Annex II species, it is considered that any potential source of effect is unlikely to degrade the qualifying habitat or habitat of species, or undermine the conservation objectives of related sites (see Table 5.2). 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) – it is not expected that the extent, distribution or functioning of these habitats would be affected in the long-term, and therefore similarly, those of any species associated with, or relying on the functioning of these habitats, such that conservation objectives would be undermined.
- **Lagoons, dunes** – sites above Mean High Water Springs not generally vulnerable to surface oil pollution, except possibly to wind-blown oil or evaporated hydrocarbons. Lagoons typically have periodic connections to the sea, such connections can be protected from the ingress of surface pollutants.
- **Sea cliffs, sea caves** – generally not considered sensitive due to wave reflection and rapid recovery (e.g. Gundlach & Hayes 1978) – it is not expected that the extent, distribution or functioning of these habitats would be affected in the long-term, and therefore similarly, those of any species associated with, or relying on the functioning of these habitats such that conservation status would be detrimentally affected.
- **Terrestrial and freshwater aquatic species** – effects on the conservation objectives of these species and their supporting habitats is essentially negated by their distribution, as these features do not utilise marine or estuarine environments. Includes: freshwater pearl mussel (*Margaritifera margaritifera*), and non-coastal otter populations (*Lutra lutra*). It should be noted that salmonids play a critical role in the life cycle of the

freshwater pearl mussel, and potential indirect effects of this association are considered in the assessment below.

Table 5.2 provides information on those categories of Annex I habitats and Annex II species which may have their conservation objectives undermined in the event of being impacted by an oil spill-those sites for which such potential effects from oil spills has been identified (see Appendix B) are listed. Due to the close proximity to each other of the Northern Ireland Blocks under consideration, site vulnerability is considered relevant for all six Blocks. Note: several sites are represented in more than one risk category.

Table 5.2: 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:** Mòine Mhór SAC, North Inishowen Coast SAC (RoI), Tranarossan and Melomore Lough SAC (RoI), Sheephaven SAC (RoI)
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:** Lough Swilly SAC (RoI)
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:** North Antrim Coast SAC, Bann Estuary SAC, Mòine Mhór SAC, Sheephaven SAC (RoI), Lough Swilly SAC (RoI)
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:** Mulroy Bay SAC (RoI)
Harbour porpoise
Sites comprise a variety of marine habitats utilised by harbour porpoise (*Phocena phocena*) 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 harbour 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:** South-East Islay Skerries SAC (harbour seal), Horn Head and Rinclevan SAC (grey seal) (RoI)
Coastal otters
Sites contain shallow, inshore coastal areas utilised by important populations of otter (*Lutra lutra*) for feeding. **Sites potentially at risk:** River Foyle and Tributaries SAC, Tayvallich Juniper and Coast SAC, Mòine Mhór SAC, North Inishowen Coast SAC (RoI), Mulroy Bay SAC (RoI), Lough Swilly SAC (RoI)
Atlantic salmon
Though not generally vulnerable to surface oil pollution due to the absence or paucity of time spent at the water's surface, available evidence suggests that smolts utilise shallow water depths (1-6m) and that adults show varying behaviour, swimming generally close to the surface though up to 40m depth, with occasional deeper dives (Malcolm *et al.* 2010). As salmonids play a critical role in the life cycle of the freshwater pearl mussel, any significant impact on populations of Atlantic salmon may also affect those of the pearl mussel. **Sites potentially at risk:** River Faughan and Tributaries SCI, River Foyle and Tributaries SAC, Owenkillew River SAC, River Roe and Tributaries SAC, River Bladnoch SAC, River Eden SAC, River Derwent and Bassenthwaite Lake SAC, River Ehen SAC, River Finn SAC (RoI)

Note: RoI – Republic of Ireland sites

5.3.1.1 Consideration

The conservation features of the sites listed in Table 5.2 are potentially vulnerable to a large oil spill due to the proximity of the blocks to the Northern Ireland coastline, which could result in significant deterioration of habitats and disturbance to species. For example, Rathlin Island SAC which supports a number of Annex I habitats (e.g. reefs, sea cliffs, sea caves and sandbanks which are not generally as ecologically sensitive to oil spill as those habitats described in Table 5.2) could be vulnerable to large oil spills due to the proximity of the Blocks to the island. Additionally, such a spill could result in damage to supporting habitats including intertidal areas utilised by a variety of foraging animals including fish, birds and marine mammals.

The likelihood of a large oil spill is extremely low (blowout occurrence frequency in the range of 1/1000-10,000 well years, see Section 5.2). The proposed work programme indicates a drill or drop well. Therefore, following examination of existing seismic information a decision will be made by the prospective licensee to drill a well or relinquish the block. As the location and design of a proposed drill or drop well is not known, a detailed assessment of the potential for effects cannot be made at this time.

Following licensing, specific activities require permitting (see Section 5.4) and those considered to present a risk to European Sites would be evaluated by DECC under mandatory contingency planning and Habitats Regulations Assessment procedures which will allow mitigation measures to be defined (including conditions attached to consents/permits or potentially consent/permit refusal). In all cases, rigorous spill prevention, response and other mitigation measures are required of operators and monitored by the regulator for offshore exploration and production.

Consent for activities will not be granted unless the operator can demonstrate that the proposed activities which may include the drilling of a well will not have an adverse affect which could undermine the conservation objectives of the qualifying features of relevant SACs.

5.3.2 Riverine SACs

(Annex II qualifying species: Atlantic salmon *Salmo salar*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, freshwater pearl mussel *Margaritifera margaritifera*)

Atlantic salmon undertake extensive migrations out to sea to feed before returning to "home" rivers to spawn. Spawning takes place in shallow excavations (redds), in shallow gravelly areas in clean rivers and streams. After a period of 1-6 years the young salmon migrate downstream to the sea as smolts. Salmon have a homing instinct and spawn in the river of their birth after 1-3 years in the sea. Atlantic salmon leave their home rivers in spring and early summer as smolts, and migrate towards feeding areas in the Nordic Seas and West Greenland. Malcolm *et al.* (2010) note that there is a general lack of data with regard to post-smolt migrations in the UK generally and in Scotland, though present observations of Atlantic salmon post-smolt activity revealed swimming depths of 1-3m, but up to 6m. Studies of adult salmon show a high degree of variability in behaviour, with individuals spending variable amounts of time between the surface and ~40m depth, with occasional dives. More generally it appears that they typically spend most of their time close to the surface, punctuated by deep dives.

Atlantic salmon are thought to travel to and from their feeding grounds along the Scottish Atlantic coast and hug the north coast of Northern Ireland before entering or leaving Lough Foyle to the west. It is also believed that salmon and sea trout may travel south through the North Channel and into the Irish Sea before entering sea loughs such as Carlingford[7].

Salmonids play a critical role in the life cycle of the freshwater pearl mussel *Margaritifera margaritifera* (e.g. Owenkillew River SAC, River Ehen SAC). The freshwater pearl mussel is long lived with records of individuals over 100 years old (Bauer 1992). The larval stage (or glochidia) of the mussel is inhaled by juvenile Atlantic salmon and brown or sea trout where it attaches to the gills and encysts. Encysted larvae live and grow in the hyper-oxygenated environment on the gills before dropping off in the following spring.

The Solway Firth, River Eden and River Derwent and Bassenthwaite Lake SACs maintain populations of river and sea lamprey. Both the river lamprey sea lamprey migrate up rivers to spawn and spend the larval stage buried in muddy substrates in freshwater. Once metamorphosis takes place, the adults migrate to the sea where they live as a parasite on various species of fish. Sea lampreys are thought to inhabit both shallow coastal and deep offshore waters, venturing further than river lampreys.

The proposed work programme indicates a drill or drop well. Therefore, following examination of existing seismic information a decision will be made by the prospective licensee to drill a well or relinquish the block. As the location and design of a proposed drill or drop well is not known, a detailed assessment of the potential for effects cannot be made at this time.

[7] Loughs Agency response to 26th Round Appropriate Assessment consultation.

Following licensing, specific activities require permitting (see Section 5.4) and those considered to present a risk to European Sites and species would be evaluated by DECC under mandatory contingency planning and Habitats Regulations Assessment procedures which will allow mitigation measures to be defined (including conditions attached to consents/permits or potentially consent/permit refusal), in addition to those mitigation measures which are mandatory – in all cases, rigorous spill prevention, response and other mitigation measures are required of operators and monitored by the regulator for offshore exploration and production.

Consent for activities will not be granted unless the operator can demonstrate that the proposed activities, which may include the drilling of a well, will not have an adverse affect which could undermine the conservation objectives of the qualifying features of any of the riverine SACs listed in Table 5.2.

5.3.3 Special Protection Areas

Table 5.3 provides information on those SPA types which are potentially vulnerable to oil spills. Those sites where the potential for effects from fuel and/or cude oil spills has been identified (see Appendix B) are listed. Due to the close proximity to each other of the Northern Ireland Blocks under consideration, site vulnerability is considered relevant for all six Blocks. Note: several sites are represented in more than one risk category.

Table 5.3: 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. **Sites potentially at risk:** Rathlin Island SPA, Sheep Island SPA, Copeland Islands SPA, North Colonsay and Western Cliffs SPA, Ailsa Craig SPA, Inishtrahull SPA (RoI), Horn Head to Fanad Head SPA (RoI)
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. **Sites potentially at risk:** Rathlin Island SPA, Larne Lough SPA, Ailsa Craig SPA, Treshnish Isles SPA, Inishtrahull SPA (RoI)
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:** None
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:** Belfast Lough Open Water SPA, Inishtrahull SPA (RoI)
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:** Belfast Lough SPA, Gruinart Flats SPA, Laggan, Islay SPA, Bridgend Flats SPA, Lough Foyle SPA (UK and RoI sites), Trawbreaga Bay SPA (RoI)

Note: RoI – Republic of Ireland sites

5.3.3.1 Consideration

The conservation features of the sites listed in Table 5.3 are potentially vulnerable to a large oil spill due to both coastal and wider foraging, and for some species, time spent at the sea surface (see Section 5.2), which could result in significant disturbance to species. Additionally, such a large spill could result in damage to supporting habitats including intertidal areas utilized by a variety of wintering waterfowl and waders.

The likelihood of a large oil spill is extremely low (blowout occurrence frequency in the range of 1/1000-10,000 well years, see Section 5.2). The proposed work programme indicates a drill or drop well. Therefore, following examination of existing seismic information a decision will be made by the prospective licensee to drill a well or relinquish the block. As the location and design of a proposed drill or drop well is not known, a detailed assessment of the potential for effects cannot be made at this time.

Following licensing, specific activities require permitting (see Section 5.4) and those considered to present a risk to European Sites would be evaluated by DECC under mandatory contingency planning and Habitats Regulations Assessment procedures which will allow mitigation measures to be defined (including conditions attached to consents/permits or potentially consent/permit refusal). In all cases, rigorous spill prevention, response and other mitigation measures are required of operators and monitored by the regulator for offshore exploration and production.

Consent for activities will not be granted unless the operator can demonstrate that the proposed activities which may include the drilling of a well will not have an adverse affect which could undermine the conservation objectives of the qualifying features of relevant SPAs.

5.3.4 Adjacent waters SACs and SPAs

The potential for oil spills to impact the integrity of SACs and SPAs in the Republic of Ireland has been assessed. Tables 5.2 and 5.3 above highlight those Irish sites that could be vulnerable to oil spills. Given the dominant wind direction in the region (from the south west), the northern nature of residual currents, and the rigorous spill prevention, response and other mitigation measures that would be in place these sites are unlikely to be impacted by spills originating from activities in the Blocks.

Consent for activities will not be granted unless the operator can demonstrate that the proposed activities which may include the drilling of a well will not have an adverse affect which could undermine the conservation objectives of the qualifying features of SACs and SPAs in the Republic of Ireland.

5.4 Regulation and mitigation

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. Under the Regulations, all operators of an offshore installation or oil handling facility must have an Oil Pollution Emergency Plan, OPEP) in place. The plans are reviewed by DECC, MCA and relevant environmental consultees, such as the Marine Management Organisation or relevant Devolved Authority, the Joint Nature Conservation Committee and the relevant

inshore statutory nature conservation body, e.g. Northern Ireland Environment Agency, before approval by DECC. OPEPs set out the arrangements for responding to incidents with the potential to cause marine pollution by oil, with a view to preventing such pollution or reducing or minimising its effect. Additional conditions can be imposed by DECC, through block-specific licence conditions (i.e. "Essential Elements").

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 currently maintains four Emergency Towing Vessels stationed around the UK, which remain on standby at sea (see footnote on 5 page 26). 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. 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. DECC is a partner in undertaking regular aerial surveillance operations of offshore installations, as a deterrent measure.

For activities in proximity to sensitive shorelines, the Department's guidance (DECC 2009a) 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. Additional resources are required for installations operating in any Block wholly or partly within 25 miles of the coastline dependent on the hydrocarbon inventory and the oil pollution incident scenarios identified, including:

- The presence near the facility at all times of a vessel:
    - with the capability of spraying dispersant within 30 minutes of an oil pollution incident notification
    - has a stock of dispersant sufficient to deal with an oil pollution incident of 25 tonnes, and if required, have the capability (equipment and capacity) of recovering any oil likely to be lost from the installation under a Tier 1[8] scenario
- In the event of a Tier 2 incident, Tier 2 resources must be available on scene within half the time taken for the oil to reach shore in 30 knot wind conditions
- Details of resources to deal with a Tier 3 incident (i.e. an oil pollution incident that cannot be controlled by Tier 1 or 2 resources), including sources transport and delivery system
- A Shoreline Protection Strategy Plan

UK oil spill contingency planning and response capabilities have been reviewed and revised following the Deepwater Horizon spill (see Section 5.1). Oil & Gas UK has established the Oil Spill Prevention and Response Advisory Group (OSPRAG) to provide a focal point for the sector's review of the industry's practices in the UK, in advance of the

[8] Oil pollution incidents are classified according to the response levels they are most likely to require and not the volume of oil pollution, unless this is supported by a location specific risk assessment. For example, if a pollution incident requires the use of resources from a regional centre, this would be used to classify the necessary response level, irrespective of its size.
For consistency with the National Contingency Plan, the following Tier definitions apply:
- Tier 1 Local (within the capability of the operator on site);
- Tier 2 Regional (beyond the in-house capability of the operator);
- Tier 3 National (requiring national resources).

conclusion of investigations into the Gulf of Mexico incident. The Group has four specialist review groups whose remit is to focus on:

- technical issues including first response for protection of personnel;
- oil spill response capability and remediation including national emergency response measures;
- indemnity and insurance requirements;
- pan-North Sea regulations and response mechanisms.

The Oil Spill Response Group (OSRG) of OSPRAG was established to review the UK's oil spill response capability and industry co-ordination with the national response mechanism. Its areas of focus are spill scenarios and modelling, review of physical response capability, sensitivity and protection mapping in relation to clean up and restoration, Oil Pollution Emergency Plans (OPEPs) and exercising OPEPs. An early action of the OSRG was to facilitate planning for an early exercise of the NCP (see above).

OSPRAG's technical review group has completed its review of the UK offshore oil and gas industry's practices in the following areas: well examination verification and primary well control, blow-out preventers (BOPs) and competency, behaviours and human factors. This work concluded that there is a high degree of confidence in the UK regulatory regime and that it drives the right safety and environmental behaviours. The Well Life Cycle Practices Forum (WLCPF) will advance recommendations made by OSPRAG and facilitate the dissemination of lessons from Macondo and other similar events, with a specific focus (among others) on BOP issues, including liaison with the HSE on the recommendation made by the House of Commons Select Committee that it examines the case for prescribing the equipment of BOPs on the UKCS with two blind shear rams.

5.5 Conclusions

Individual European Sites have been categorised in terms of potential vulnerability, based on location in relation to known hydrocarbon prospectivity of the proposed licence Blocks (currently unknown but assumed to be oil as worst case in terms of potential spill impacts) and therefore the nature and magnitude of credible risks. Two categories of vulnerability were identified:

- Those sites considered to be at potential risk, with the possibility of impacts in the event of a significant spill of crude oil, bunker or lube oil (i.e. where site conservation objectives are at risk of being undermined/where present conservation status may be negatively affected).
- Many sites are considered not to be at risk from oil spills associated with activities in the Blocks, due to their distance from the Blocks and relative sensitivity of the 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 low. This results from the combination of low probability and low severity (since most spills would be small in volume). 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 UK 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.

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 activities which may follow licensing; however, as oil spills are not intended activities, a risk-based assessment is appropriate.

Following licensing, specific activities require permitting (see section above) and those considered to present a risk to European Sites would be evaluated by DECC under mandatory contingency planning and Habitats Regulations Assessment procedures which will allow mitigation measures to be defined (including conditions attached to consents/permits or potentially consent/permit refusal). In all cases, rigorous spill prevention, response and other mitigation measures are required of operators and monitored by the regulator for offshore exploration and production.

Given the availability of prevention and mitigation measures which are applied prior to consenting any activity including project specific safety, oil spill risk assessment, response, inspection and other monitoring, and the requirement for project specific Habitats Regulations Assessment, DECC considers that the granting of a Seaward Production Licence (or Licences) for Blocks 125/18, 125/19, 125/20, 125/23, 125/24 and 125/25 would not adversely affect the integrity of European Sites.

Consent for activities will not be granted unless the operator can demonstrate that the proposed activities, which may include the drilling of a well, will not have an adverse affect on the site integrity of Natura 2000 sites.

6 Consideration of sites and potential physical and other effects

6.1 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.

6.2 Physical damage at the seabed

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

- **Anchoring of semi-submersible rigs**. Semi-submersible rigs use anchors to hold position, typically between 8 and 12 in number at a radius depending on the water depth, and cause seabed disturbance from the anchors and chain or cables, and in cohesive sediments, leave 'anchor mounds' after their retrieval.

- **Placement of jack-up rigs**. Jack-up rigs, normally used in shallower water, leave three or four depressions from the feet of the rig (the spud cans) around 15-20m in diameter. In locations with an uneven seabed, material such as grout bags may be placed on the seabed to stabilise the rig feet.

- **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 assumed to be oil and given the location of the Blocks applied for and the lack of existing infrastructure, it is anticipated that new field developments would require new infrastructure. 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.

The broad distribution of large scale biotopes of conservation importance is relatively well understood in the region (e.g. see McBreen *et al.* 2011). Within the boundaries of designated and potential SACs the occurrence of habitats of interest is usually known with greater precision. 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. Provisions under the Marine and Coastal Access Act (2009) include certain activities previously covered by the Food and Environment Protection Act; guidance on these is pending. 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.

6.3 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).

Most studies of produced water toxicity and dispersion, in the UK and elsewhere (see E&P Forum 1994, OLF 1998, Riddle *et al*. 2001, Berry & Wells 2004) have concluded that the necessary dilution to achieve a No Effect Concentration (NEC) would be reached at <10 to 100m and usually less than 500m from the discharge point. However, under some circumstances (e.g. strong stratification: Washburn *et al.* 1999), a plume concentration sufficient to result in sub-lethal effects may persist for >1,000m (Burns *et al*. 1999).

Monitoring with caged mussels in the Netherlands and Norwegian sectors of the North Sea has shown that mussels exposed to produced water discharges may accumulate PAH and show biological responses up to 1,000m from the discharge. Concentrations of PAHs and alkyl phenols and measured biological responses in wild fish such as cod and haddock

caught in the vicinity of offshore installations from Norwegian waters in 2002 and 2005 showed a mixed pattern mostly with no increased concentrations, but some elevated biological responses suggesting past exposure. Exposure of cod sperm cells to environmentally relevant concentrations (100, 200, 500ppm) of produced water from the Hibernia platform, Newfoundland, did not result in a strong toxicity to the cells (only subtle changes were observed) or a significant change in fertilisation rate (Hamoutene *et al.* 2010).

The OSPAR QSR (2010) noted that results from water column monitoring are complex to interpret, particularly for wild fish for which it is not possible to link observed biological responses to a specific exposure source. Monitoring data are limited and do not yet allow conclusions to be drawn on the significance of observed responses for marine life and ecosystems. However, OSPAR Recommendation 2001/1 for the Management of Produced Water from Offshore Installations includes a presumption against the discharge to sea of produced water from new developments. Only under certain circumstances (e.g. injection pump maintenance) may the effluent be routed to sea. Any produced water discharged will be treated since it is still required to meet legal quality standards in terms of oil in water concentration (DECC 2011).

Drilling wastes are a major component of the total waste streams from offshore exploration and production, with typically around 1,000 tonnes of cuttings resulting from an exploration or development well. Water-based mud cuttings are discharged at, or relatively close to sea surface during “closed drilling” (i.e. when steel casing and a riser is in place), whereas surface hole cuttings will be discharged at seabed during “open-hole” drilling. Use of oil based mud systems, for example in highly deviated sections or in water reactive shale sections, would require the onshore disposal or reinjection of a proportion of waste material (DECC 2011).

In contrast to historic oil based mud discharges, effects on seabed fauna of the discharge of cuttings drilled with WBM and of the excess and spent mud itself are usually subtle or undetectable, although the presence of drilling material at the seabed close to the drilling location (<500m) is often detectable chemically (e.g. Cranmer 1988, Neff *et al.* 1989, Hyland *et al.* 1994, Daan & Mulder 1996). Considerable data has been gathered from the North Sea and other production areas, indicating that localised physical effects are the dominant mechanism of ecological disturbance where water-based mud and cuttings are discharged (DECC 2011).

Currie & Isaacs (2005) reported that water based drilling muds and associated cuttings modified population densities of benthic infaunal species at sampling sites up to 200m from an exploration well in the Minerva field, Australia. The most pronounced effects were evident within 100m of the well-head, where declines in density of most abundant species exceeded 70% immediately following drilling. However, effects on the community structure at sites 100 and 200m from the wellhead did not persist beyond four months as natural species recruitment swamped residual effects over the same period. In contrast, benthic communities at the well-head site remained modified 11 months after drilling, in spite of recoveries in species diversity and abundance. This persistent community difference was likely due to the physical modification of the sediment at this site by drill cuttings discharge.

OSPAR (2009) concluded that the discharge of drill cuttings and water-based fluids may cause some smothering in the near vicinity of the well location. The impacts from such discharges are localised and transient, but may be of concern in areas with sensitive benthic fauna, for example corals and sponges.

DEFRA have indicated that seabed surveys should be undertaken before any drilling activity is carried out in Block 125/23, to confirm whether there are any herring spawning sites within a three-nautical mile radius of the proposed drilling location. On the basis of the survey results, DECC may refuse to grant consent, impose extra conditions on the consent, or require the drilling location to be moved.

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. Amendments to the Offshore Chemical Regulations (2002) in 2011 mean that additional activities are now captured within a permit. 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 in detail in project-specific Environmental Statements, AAs (where necessary) and chemical risk assessments under existing permitting procedures.

6.4 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 effects of light on birds have been raised in connection with offshore oil and gas over a number of years (e.g. Weise *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. Platform illumination and flares have been shown to have an attractive effect on many species of seabird; this attraction is enhanced by conditions of poor visibility such as fog, haze and drizzle (Weise *et al.* 2001 and references therein). Bird mortality resulting from collisions with the structure and flare (leading to incineration) is the primary concern, although any such mortality will be several orders of magnitude lower than that of natural or other anthropogenic mortality (e.g. predation by domestic cats) and is not considered to be significant at a population-level. The lights on installations and vessels are primarily non-flashing so the strong behavioural effects noted by Bruderer *et al.* (1999) in response to a strong searchlight being switched on and off are not anticipated. Potential effects can be mitigated through the control or avoidance of well test and routine flaring during production,

and timing controls can be used since drilling and construction are temporary activities. It is therefore concluded that light effects will not affect site integrity, nor undermine the conservation objectives of sites with qualifying mobile species (e.g. birds) which could potentially interact with illuminated platforms and vessels.

Physical disturbance of seaduck and other waterbird flocks by vessel and aircraft traffic associated with oil and gas exploration and production are 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. It is considered this source of potential effect will not result in significant disturbance to the species within Natura 2000 sites or threaten the viability of populations of qualifying features at relevant sites (e.g. Rinns of Islay SPA) because of the location of the SPAs relative to the Blocks applied for, the absence of marine SPAs designated for particularly sensitive (shy) species in the region, 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, timing controls on temporary activities to avoid sensitive periods. Oil and gas developments also tend to be primarily subsea infrastructure based, and therefore any disturbance at the sea surface is reduced to periods of construction and decommissioning only, with the likelihood of significant disturbance to species further reduced. It is therefore concluded that adverse effects from physical disturbance are not expected.

6.5 Implications for relevant European Sites

The screening process (summarised in Appendix B) identified that the conservation objectives of a number of Natura 2000 sites (North Antrim Coast SAC, Rathlin Island SAC/SPA, Sheep Island SPA and Antrim Hills SPA) could potentially be affected by physical disturbance as a result of activities following licensing of the Blocks, primarily through physical damage or loss from smothering by drilling discharges, or the installation of infrastructure and cables. However, any potentially damaging activities that could following licensing of Blocks 125/18, 125/19, 125/20, 125/23, 125/24 and 125/25 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.

6.6 Conclusions

Adverse effects identified with regards to physical effects on the seabed, marine discharges and other disturbance effects (e.g. lighting, vessel and aircraft traffic), when aligned with project level mitigation and relevant activity permitting, will not threaten the long-term viability of qualifying habitats and/or populations of species of the Natura 2000 sites considered in this assessment. It is unlikely that any new terminals would be built as a result of developments following 26th 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 125/18, 125/19, 125/20, 125/23, 125/24 and 125/25 will not cause an adverse effect on the integrity of European Sites, though consent for activities will not be granted unless the operator can demonstrate that the proposed activities which may include the drilling of a well will not have an adverse affect on the integrity of European Sites.

7 Consideration of sites and potential acoustic effects

7.1 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 lungs which are sensitive to rapid pressure changes. Most concern in relation to seismic noise disturbance has been related to cetacean species. However, some pinnipeds are known to vocalise at low frequencies (100-300Hz) (Richardson *et al*. 1995), suggesting that they have good low frequency hearing and are therefore sensitive to acoustic disturbance. 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.

The coastal and offshore waters of western Scotland support a rich diversity and high density of marine mammals. Harbour porpoise and white-beaked dolphins are widespread and numerous (with harbour porpoise listed as present but not a qualifying feature in the Firth of Lorn SAC, Treshnish Isles SAC, Sunart SAC and Sound of Arisaig SAC and as a proposed qualifying feature in the Skerries and Causeway dSAC). They are encountered throughout the year, although most frequently during summer months, when Risso's dolphins, common dolphins and minke whales are also sighted fairly frequently (DECC 2009b, 2011). There are a number of SACs in the region designated for their seal populations, and there are also sites where they are listed as being present but not as a qualifying feature (e.g. harbour and grey seals are present in the Rathlin Island SAC).

DEFRA identified periods of concern for seismic (see Table 2.1) and it is envisaged that consent would not be granted for seismic survey during this period. 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). Relevant sites in the region include several designated for the presence of the Annex II species Atlantic salmon (e.g. a number of riverine SACs including the River Roe and Tributaries SAC and River Faughan and Tributaries SCI) and two species of lamprey (e.g. Mull of Galloway and Solway Firth). Specific to Atlantic salmon, Knudsen *et al*. (1994) showed that a source of intense low frequency sound (10Hz) within a river acted as an acoustic barrier to young salmon, with fish being displaced to an area where the intense sound was absent. Furthermore, numerous fish species present in the region provide important components of the diet of qualifying species of other relevant European Sites, such as harbour seal *Phoca vitulina* (e.g. Strangford Lough SAC, Murloch SAC, South-East Islay Skerries SAC), grey seal *Halichoerus grypus* (e.g. Treshnish Isles SAC) and several seabird species such as guillemot, herring gull, razorbill (e.g. Rathlin Island SPA, Horn Head to Fanad Head SPA (RoI)).

There are currently no UK Natura 2000 sites with mobile marine invertebrates as qualifying features. However, invertebrates such as crabs and squid may form an important component of the diet of qualifying species of relevant European Sites, for example harbour 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). Impact on prey species (e.g. fish) could undermine conservation objectives for sites, for instance this may represent an indirect disturbance to qualifying species, or a temporary deterioration of the functioning of the habitats which support qualifying species (see Table 4.1), though mitigation measures are available (see Section 7.4) the implementation of which will also be assessed in detail once project plans are available.

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 could be implemented.

7.2 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 (although no seismic survey is proposed by the work programmes). 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.

7.2.1 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. The proposed work programme for the Blocks does not include undertaking a 2D or 3D seismic survey. However, prior to the drilling of a proposed drill or drop well, a rig site survey would be required to determine the presence of shallow gas deposits or any other potential hazard prior to locating a drilling rig. Rig site surveys utilise much reduced source level in comparison to deep seismic; a typical equipment spread

includes analogue sidescan sonar (100/500kHz), hull-mounted single beam echo sounder, multibeam swathe bathymetry and subbottom profiler. For some high resolution digital surveys a small airgun source of 150-200 cubic inches may be used. The area covered by rig site surveys is small (a few km^2) and the surveys are of short duration (<5 days).

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 source increases, higher frequencies are attenuated more rapidly. 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. In the St George's Channel, Goold and Fish (1998) recorded 8kHz sounds above background levels at a range of 8km from the source, even in a high noise environment.

7.2.2 Other activities

Pile-driving of foundations may generate high source levels and has been widely recognised as a potential concern, in particular for large offshore wind developments where many piles may be installed sequentially over long time scales (as reviewed in DECC 2011). Brandt *et al.* (2011) reporting on piling operations at the Horns Rev II site off the Danish west coast, indicated that during 1 pile driving event, the peak noise level reached 196 dB re 1 µPa, the sound exposure level (SEL) reached a maximum of 176 dB re 1 μPa^2 s and the M-weighted SEL (see below) reached 170 dB re 1 μPa^2 s at 720m distance. At a distance of 2,300m, peak levels reached 184 dB re 1 µPa, SEL 164 dB re 1 μPa^2 s and M-weighted SEL reached 157 dB re 1 μPa^2 s. Pile-driving also occurs in connection with oil and gas facilities, although the pile diameters are smaller than wind turbine monopiles and typically result in lower source levels and durations.

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 undertaken (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, however, 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.

7.2.3 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.

There is now a reasonable body of evidence to quantify noise levels associated with both seismic survey and pile-driving, and to understand the likely propagation of such noise within the marine environment. There is less clarity about the potential effects on marine mammals (and other receptors including fish), particularly in relation to distinguishing a significant behavioural response from an insignificant, momentary alteration in behaviour. Consequently, recent expert assessments have 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. A similar approach can be taken to multi-pulsed sounds although the evidence base is small and contradictory.

Behavioural responses to anthropogenic noise have generally been studied by visual or acoustic monitoring of abundance. Visual monitoring of cetaceans during seismic surveys has been carried out for several years throughout the UKCS. Statistical analysis of 1,652 sightings during 201 seismic surveys, representing 44,451 hours of observational effort, was reported by Stone (2003) and Stone & Tasker (2006). Sighting rates of white-sided dolphins, white-beaked dolphins, *Lagenorhynchus* spp., all small odontocetes combined and all cetaceans combined were found to be significantly lower during periods of shooting on surveys with large airgun arrays. In general, small odontocetes showed the strongest avoidance response to seismic activity, with baleen whales and killer whales showing some localised avoidance, pilot whales showing few effects and sperm whales showing no observed effects.

Brandt *et al.* (2011) reported on the spatial and temporal scale of behavioural responses of harbour porpoises to construction noise at the Horns Rev II offshore wind farm site. Porpoise acoustic activity (measured by passive acoustic monitoring devices (T-PODs)) was reduced by 100% during 1h after pile driving and stayed below normal levels for 24 to 72 h at a distance of 2.6km from the construction site. This period gradually decreased with increasing distance. A negative effect was detectable out to a mean distance of 17.8km. At 22km it was no longer apparent, instead, porpoise activity temporarily increased. This might indicate that porpoises at this distance showed no behavioural reaction to pile driving. Animals moving away from the construction site might have caused porpoise abundance and thus porpoise acoustic activity to temporarily increase as animals aggregated there. Out to a distance of 4.7km, the recovery time was longer than most pauses between pile driving events. Consequently, porpoise activity and possibly abundance were reduced over the entire 5 month construction period.

Both harbour and grey seals have shown short-term avoidance behaviour during controlled exposure experiments with small airguns (Thompson *et al*. 1998). In both cases seals abandoned foraging sites and swam away from airguns but returned to forage in the same areas on subsequent days. By contrast, Harris *et al.* (2001) making observations from a seismic vessel operating in a shallow lagoon system in the Canadian Arctic, found no significant change in sightings rate between firing and non firing periods. Mean radial distance to sightings did increase, suggesting some local avoidance behaviour. (Hammond *et al.* 2006)

7.2.4 Injury and behavioural criteria

The Offshore Energy SEAs (DECC 2009b, 2011) reviewed recent data and recommendations for injury and behavioural criteria for noise assessment in marine mammals, although with emphasis on pulse noise from high-energy deep seismic survey and pile-driving. The OESEA utilised injury criteria proposed by Southall *et al*. (2007) 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, Southall *et al*. (2007) were unable to derive explicit and broadly applicable numerical threshold values for delineating behavioural disturbance, and suggested that a context-based approach to deriving noise exposure criteria for behavioural responses will be necessary.

Based on the criteria developed by Southall *et al*. (2007) indicative spatial ranges of injury and disturbance for cetaceans and pinnipeds may be calculated as indicated in Table 7.1 below. Calculated ranges for the Southall *et al*. (2007) criteria suggest that there is negligible risk of auditory damage to cetaceans, and a low to moderate risk of seals being within the required range (63m assuming modified cylindrical spreading) of seismic operations. Modified cylindrical spreading is usually considered to occur in water depths <1.5x range, i.e. spherical spreading (20logR) will occur to a range of 60m in a water depth of 40m.

Table 7.1: Indicative spatial ranges of various injury and disturbance indicators for cetaceans and pinnipeds

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

Source: Southall et al. (2007)

The ranges affected by potential auditory injury resulting from modelled seismic survey, which assume a much larger source level than will be used for proposed site survey in the Blocks, represent a small proportion of the marine areas used by seals (and cetaceans) associated with European Sites in the region. Larger proportions of the overall ranges may be affected by noise levels possibly associated with behavioural modification, although the ecological significance of such postulated effects have not been demonstrated. It is acknowledged here that injury and disturbance do not necessarily lead to an adverse

impact on the integrity of a European site under the Habitats Directive, and indeed disturbance licences can be granted for certain levels of activity, without site integrity being compromised. Therefore, disturbance effects both within and 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 non-shooting, 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.

7.3 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. It is noted that effects on fish which are also prey species (e.g. for marine mammals and birds), and may therefore result in the undermining of conservation objectives of qualifying species, are unlikely from noise sources associated with oil and gas activities, with noise levels suggested to cause injury to fish not extending beyond a few tens of metres around the noise source. Mandatory Habitats Regulations Assessment procedures will allow further consideration of the nature, timing and location of any planned activities and mitigation measures (see Section 7.4) deemed necessary to be defined (including conditions attached to consents/permits or potentially consent/permit refusal). The screening process (Appendix B) identified the potential for acoustic disturbance in the following sites:

7.3.1 South-East Islay Skerries SAC

(Annex II species: harbour seal *Phoca vitulina*)

On the west coast of Scotland, harbour seals habitually utilise rocky shores, islets and skerries as haul-out areas to rest, pup and moult. The skerries, islets and undisturbed mainland shores in south-east Islay have consistently supported around 600 harbour seals,

representing approximately 2% of the UK and 1% of the EU populations of the species. Surveys by the Seal Mammal Research Unit (SMRU) indicate that the population is stable.

The seals are usually scattered along seaweed covered tidal ledges in small groups of around fifty animals. Adult harbour seals can remain very faithful to particular haul-out areas, typically moving around the same group of favoured locations over a number of years. However, the use of particular haul-out areas can vary according to the annual cycle and local weather conditions. South-east Islay Skerries European marine site holds one of the largest discrete groups of harbour seals in south-west Scotland and the colony is representative of the Inner Hebridean and west coast population. Large colonies are important in maintaining overall population size and are significant as sources of emigration to smaller or newly established groups (Scottish Natural Heritage 2006a).

7.3.2 Eileanan agus Sgeiran Lios mór SAC

(Annex II species: harbour seal *Phoca vitulina*)

The small islands and skerries around Lismore consistently support a nationally important breeding colony of the harbour seal *Phoca vitulina*. Around 600 adults haul out at the site to rest, pup and moult. This represents one of the larger discrete colonies of harbour seals in the UK and is equivalent to around 2% of the UK and 1% of the EU populations of the species. The site is the most sheltered and enclosed harbour seal SAC on the west coast of Scotland and haul-out areas reflect the habit of west coast harbour seals to utilise rocky shores, islets and skerries. Attributes of the harbour seals habitat are the availability and ease of access to suitable and undisturbed breeding, pupping, moulting and haul-out areas. Also, the availability of undisturbed shores and adjacent areas of sea to facilitate adult social interactions, mating and to act as a nursery area. Surveys by the Seal Mammal Research Unit (SMRU) indicate that the population is stable (Scottish Natural Heritage 2006b).

7.3.3 Treshnish Isles SAC

(Annex II species: grey seal *Halichoerus grypus*)

The Treshnish Isles consistently support an internationally important colony of the grey seal *Halichoerus grypus*. Around 1,100 pups are produced at the site each year. This is equivalent to a total population of approximately 3,400 animals, representing around 3% of the UK and 2.8% of the EU populations of the species. The Treshnish Isles contribute to the series of sites around the coast that have been selected to maintain the geographic range and status of grey seal breeding colonies in the UK. Large colonies are important in maintaining overall population size and are significant as sources of emigration to smaller or newly established groups. Surveys by the Seal Mammal Research Unit (SMRU) indicate that the population is being maintained (Scottish Natural Heritage 2006c).

Attributes of the grey seal habitat are the availability and ease of access to suitable and undisturbed breeding, pupping, moulting and haul-out areas on the island. Also, the availability of undisturbed shores and adjacent areas of sea facilitate adult social interactions and mating, whilst also acting as a nursery area. Pools on the island are of particular importance, as they are frequently used by the seals as rookery locations. The near-shore habitats, particularly shallow bedrock reefs, are important foraging grounds for the seals. Grey seals are shy aquatic mammals that frequent remote and isolated coasts and offshore islands, and may desert a locality if subjected to disturbance.

7.3.4 Strangford Lough SAC and Murlough SAC

(Annex II species: harbour seal *Phoca vitulina*)

A thermal imaging survey of the entire coast of Northern Ireland during the moult in August 2002 counted 1,248 harbour seals, of which 180 seals were in Strangford Lough and 299 seals in the Murlough SAC (Duck 2006). Recent data from Strangford Lough suggest that harbour seal counts have declined by 3% per annum (95% CI: 1-5%) producing a 35% decline over the period 1994 to 2006 (SCOS 2007). Aerial surveys by SMRU of seals in Strangford Lough as part of the Seagen environmental monitoring programme also noted a gradual decline in seal numbers between 2006 and 2010 (Royal Haskoning 2010). Recent tracking studies of seals tagged within Strangford Lough have suggested that the population feeds mainly in the Irish Sea and that seals that occur within the Lough also regularly haul out at sites out-with the Lough (AECOM & Metoc 2009).

7.3.4.1 Consideration

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 7.2. 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, where 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 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 resulting from reflection, refraction and diffraction in the propagating medium. Frequency dependence due to destructive interference also forms an important part of the weakening of a noise signal.

In the case of the South-East Islay Skerries SAC, the minimum direct linear range from the SAC boundary to the nearest Block (125/20) is approximately 13km, giving a propagation loss (assuming 15logR) of around 62dB[9], or a received sound level of 168dB 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.

In the case of the Treshnish Isles SAC, Eileanan agus Sgeiran Lios mór SAC, Strangford Lough SAC and Murlough SAC land barriers between the sites and Blocks applied for preclude tangible simple calculations of direct linear range and received noise levels within the sites. However, to inform the assessment the minimum distance between the Blocks and the sites has been used to provide general estimates of received sound levels at the sites (Table 7.2).

[9] 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). Figure rounded to the nearest whole number.

Table 7.2: Estimated received sound levels in relevant European Sites associated with a typical seismic survey

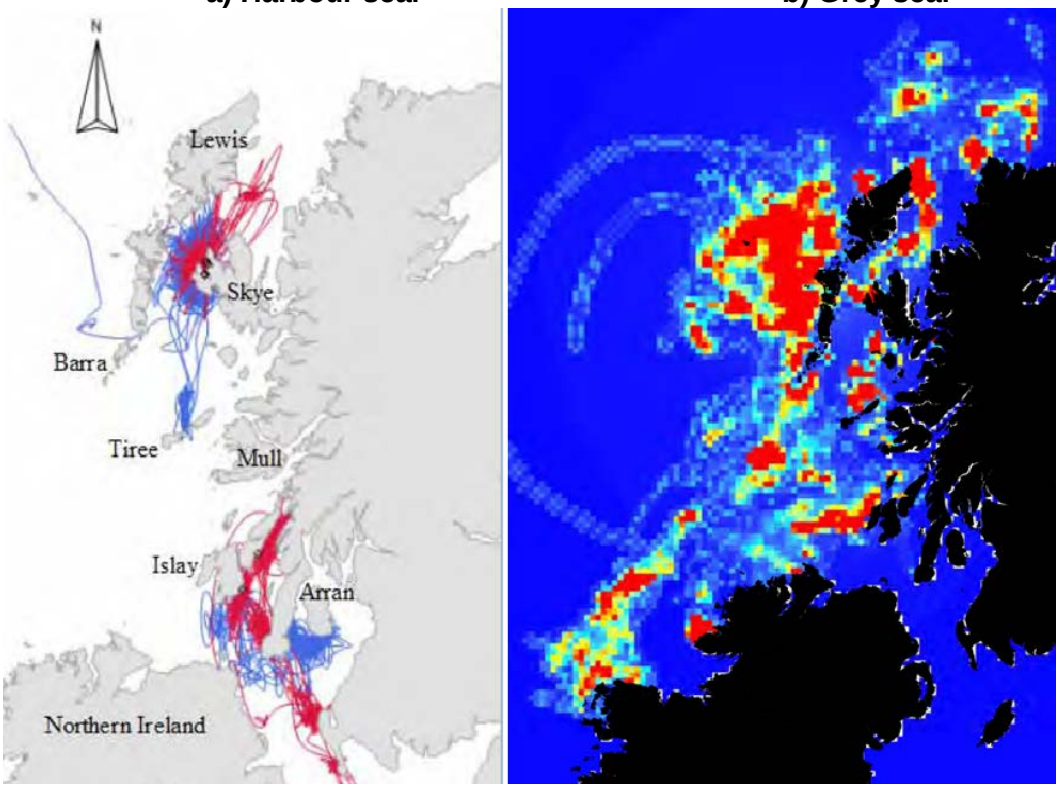
Site	Relevant qualifying Annex II species	Minimum distance (km)	Received sound level (dB re 1μPa peak-to-peak)
South-East Islay Skerries SAC	Harbour seal	13	168
Treshnish Isles SAC	Grey seal	109	154
Eileanan agus Sgeiran Lios mór SAC	Harbour seal	131	153
Strangford Lough SAC	Harbour seal	103	155
Murlough SAC	Harbour seal	124	154

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.

Seal tracking provides information on the foraging movements of both harbour and grey seals in the region (as reported by Hammond *et al.* 2006 for SEA 7). Twenty four harbour seals were tagged in Jura and Islay in September 2003 and April 2004, and in northwest Skye in September 2004 and March 2005. The smoothed tracks of these animals are shown in Figure 7.1a. Two geographical scales of movement were apparent. Most trips were short to within 25km of the haul-out site, often (25-40% of the time) returning to the same site; thus a degree of site-fidelity and coastal foraging was apparent. However, some individuals made longer trips of over 100km, indicating that animals from haul-out sites were not completely isolated. Longer distance movements in southwest Scotland showed some seasonality, occurring predominantly at the end of September and the end of March. Almost half of the trips lasted between 12 and 24 hours although some trips lasted several days, with the longest recorded trip lasting more than 9 days.

Figure 7.1: Harbour (a) and grey seal (b) usage of coastal waters of western Scotland and Ireland

a) Harbour seal **b) Grey seal**



Note:

a) Individual tracks of male (blue) and female (red) harbour seals tagged off the Isles of Skye, Islay and Jura.

b) Spatial distribution of usage based on telemetry data from ~75 individual grey seals, haulout counts and accessibility of points in space relative to the haulout sites. Red indicating high usage and blue low usage.

Source: Hammond et al. (2006)

Telemetry data from about 75 grey seals tagged in and around the SEA7 area (western Scotland) show much individual variability in their movement patterns west of Scotland, as has been found in other areas around Britain (McConnell 1999, Matthiopoulos *et al*. 2004). Some animals ranged widely and spent time in a variety of locations; others remained in one limited area for most of the time. Figure 7.1b shows the modelled at-sea usage for grey seals off the west coast of Scotland and Ireland. Several areas of relatively high usage in the SEA-7 area are clear. The shelf waters west of the Outer Hebrides are extensively used by grey seals, and there are "hot spots" on Stanton Bank to the south of Barra, waters to the west of Islay and Jura, and waters east of Lewis.

Seismic survey occurring in the proposed licence Blocks will be audible to seals over a large area of the coastal waters of Northern Ireland and south western Scotland characterised by moderate to high marine usage by foraging harbour and grey seals (see Figure 7.1). Noise levels suggested to cause auditory damage in seals are rapidly attenuated with distance from source, and would therefore not propagate into the SACs and have very limited potential for spatial overlap with seals foraging beyond the boundary of the SACs. 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 (see Section 7.4). Additionally, any future seismic survey

plans would be subject to an extensive source- and site-specific assessment of the potential for adverse, including AA.

If significant ecological effects on prey species were to occur, even at considerable distances from the SACs, these may influence the breeding population of the site. 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 is highly unlikely to undermine the conservation objectives in relation to grey and harbour seals from relevant SACs in the region (e.g. affect the distribution of species or supporting habitats, result in significant disturbance to the species or affect the viability of the population).

DEFRA have identified a period of concern for seismic for Blocks 125/18, 125/23, 125/24 and 125/25 from August to September with respect to fish spawning. There is a presumption of refusal for the activity concerned during these periods. However, it may be possible to agree appropriate mitigation measures at the project level to minimise potential adverse effects, to the extent that the objection can be withdrawn.

The proposed work programme for the Blocks does not include seismic survey. Noise levels associated with other activities potentially resulting from licensing of the Blocks such as a rig site survey, 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.

7.3.5 Riverine SACs

The potential for acoustic disturbance effects was identified for the following riverine SACs due to their proximity to the Northern Ireland Blocks and the presence of Atlantic salmon as a qualifying feature: River Faughan and Tributaries SCI, River Foyle and Tributaries, Owenkillew River, River Roe and Tributaries (Northern Ireland), River Bladnoch, Endrick Water (Scotland), River Eden, River Derwent and Bassenthwaite Lake and River Ehen (England). As stated in Section 5.3, salmonids play a critical role in the life cycle of the freshwater pearl mussel *Margaritifera margaritifera*, which is also a qualifying feature (unfavourable recovering) in the Owenkillew River and River Ehen SACs. Any potential impacts on viability of the Atlantic salmon population, its distribution or supporting habitats, should also be considered in the context of the freshwater pearl mussel.

Atlantic salmon leave rivers to enter the marine environment during spring-summer as smolts, before migrating to feeding areas in Nordic Seas and West Greenland. Following 1-3 years at sea, adult salmon return to their home rivers primarily during summer months. Due to their low densities offshore and the highly localised range of noise levels likely to cause injury to fish, the potential for acoustic disturbance effects is restricted to disruption to their migration from, and principally to, the designated rivers. The potential for impact can be mitigated through timing of seismic survey to avoid the period of peak salmon entry into the rivers and consequently avoid undermining the conservation objectives in relation to both Atlantic salmon, and by association, the freshwater pearl mussel.

The Solway Firth, River Eden and River Derwent and Bassenthwaite Lake SACs maintain populations of river and sea lamprey. Significant propagation of underwater noise into shallow enclosed and semi-enclosed bays and estuaries is not expected, and therefore the potential for effects is restricted to lamprey occupying marine areas.

The proposed work programme for the Blocks does not include seismic survey. Noise levels associated with other activities potentially resulting from licensing of the Blocks such as a rig site survey, drilling and vessel movements, are of a considerably lower magnitude than those resulting from geological seismic survey, and are not expected to adversely affect site integrity.

7.3.6 Adjacent waters SACs

The potential for acoustic disturbance effects was identified for the Horn Head and Rinclevan SAC due to presence of grey seal as a qualifying Annex II species. The minimum distance from the SAC boundary to the nearest Block (125/23) is approximately 91km, giving a received sound level of 166dB 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.

The proposed work programme for the Blocks does not include seismic survey. Noise levels associated with other activities potentially resulting from licensing of the Blocks such as a rig site survey, drilling and vessel movements, are of a considerably lower magnitude than those resulting from geological seismic survey, and are not expected to adversely affect site integrity.

7.4 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 on 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* (August 2010 revision reflects amendments (2007 and 2009 amendments) to the *Conservation (Natural Habitats &c.) Regulations 1994 (Habitat Regulations) for England and Wales* and the *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (Offshore Marine Regulation*s, as amended in 2009 and 2010). 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. European Protected Species (EPS) disturbance licences can also be issued under the *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007*.

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 (2010) advise that operators adopt mitigation measures which are appropriate to minimise the risk of an injury or disturbance offence[10] and stipulate, whenever possible, the implementation of several best practice measure, including:

- If marine mammals are likely to be in the area, only commence seismic activities during the hours of daylight when visual mitigation using Marine Mammal Observers (MMOs) is possible.
- Only commence seismic activities during the hours of darkness, or low visibility, or during periods when the sea state is not conducive to visual mitigation, if a Passive Acoustic Monitoring (PAM) system is in use to detect marine mammals likely to be in the area, noting the limitations of available PAM technology (seismic surveys that commence during periods of darkness, or low visibility, or during periods when the observation conditions are not conducive to visual mitigation, could pose a risk of committing an injury offence).
- Plan surveys so that the timing will reduce the likelihood of encounters with marine mammals. For example, this might be an important consideration in certain areas/times, e.g. during seal pupping periods near Special Areas of Conservation for harbour seals or grey seals.
- 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 the airguns (this would also be relevant for other acoustic energy sources).

Due to the importance of the area to marine mammals, DECC will expect that passive acoustic monitoring (PAM) will be routinely used as a mitigation tool. Periods of seasonal concern for seismic survey are also identified for a number of Blocks considered in this AA (see Table 2.1), for which there would be a presumption against such activity taking place.

In addition to marine mammal sensitivities, disturbance to populations of Atlantic salmon and other qualifying anadromous species can be mitigated through timing of seismic survey to avoid migratory periods and consequently significant disturbance can be avoided. In particular JNCC[11] highlight the sensitive post-smolt migration period for Atlantic salmon between April and May, and that mitigation, including a presumption against seismic survey at this time, is considered.

7.5 Conclusions

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 (see Defra (2010). This would require direct mortality, behavioural response with implications

[10] Defined under Regulation 39 1(a) and 1(b) (respectively) of the *Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007* (as amended) or Regulation 33 of The Conservation (Natural Habitats &c.) Regulations (Northern Ireland) 1995 (as amended) in territorial waters.
[11] JNCC's response to the 26th Seaward licensing Round.

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 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.

For the Northern Ireland Blocks under consideration, calculations considering the direct linear range to the SAC boundaries and the source level of a typical seismic survey suggest that received noise levels within all SACs will fall below relevant effects criteria as defined by Southall *et al*. (2007).

Bearing in mind the information presented above and in the Appendices, it is concluded at the currently available level of definition, the proposed licensing of the Blocks would not be expected to cause an adverse effect on the integrity of the European Sites, taking account of the following:

- No geological seismic survey is proposed by the work programme although a rig site survey may be required prior to locating a drilling rig. Should a rig site survey be proposed in the Blocks, further Habitats Regulations Assessment may be required to assess the potential for significant effects on site integrity once the area of survey, source size, timing and proposed mitigation measures are known and can form the basis for a definitive assessment.
- It is considered reasonable to conclude that no effects will result with significant influence on the integrity of qualifying species within the other SACs in the vicinity of the Blocks.
- The utilisation of areas outside the designated SAC boundaries is not well understood, but the known extensive range of grey and harbour seals, and available population monitoring indicates that activities associated with proposed licensing will not have significant influence on the integrity of qualifying species.

Consent for activities will not be granted unless the operator can demonstrate that the proposed activities which may include a rig site survey will not have an adverse affect on the site integrity of European Sites.

8 In-combination effects

Potential incremental, cumulative, synergistic and secondary effects from a range of operations, discharges, emissions (including noise), and accidents were considered in the Offshore Energy SEAs (DECC 2009b, 2011; see also OSPAR 2000, 2010).

8.1 Underwater Noise

Seismic survey (although not currently proposed as part of the work programme) 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". The region has not been exposed to intensive seismic survey activities in the past and is unlikely to be in the future given the limited prospectivity. Oil and gas activities across the region (including both shelf waters and deeper waters to the north and west) are limited 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 within the region include those associated with the development of marine renewable energy. Offshore wind energy is expected to undergo large-scale development in the region over the next decade. There are exclusivity agreements in place for significant development in Scottish territorial waters. Of particular relevance are the proposed Kintyre (378MW) and Islay (680MW) sites with the Solway Firth (300MW), Wigtown Bay (280MW) and Argyll Array (1,500MW) sites also relevant. In addition, there are a number of Round 2 offshore wind farm sites under construction and following the Offshore Energy SEA, The Crown Estate have entered a Round 3 zonal development agreement for the generation of up to 4GW of offshore wind energy respectively from an Irish Sea zone. The consenting of developments in this region will be subject to detailed project-specific EIA and Habitats Regulations Assessments.

The Limpet wave device on Islay is currently the only infrastructure deployed in the region associated with the extraction of wave and tidal energy. A draft offshore renewable energy plan to develop at least 600MW of offshore wind and 300MW from tidal resources in Northern Ireland waters by 2020 has recently undergone Strategic Environmental Assessment (AECOM & Metoc 2009). The area of the Blocks has been identified for its potential tidal energy resource (Tidal Resource Zone 2: Rathlin Island and Torr Head) with a North Coast resource zone identified for wind, wave and tidal to the west of the Blocks. The SEA identified a number of relevant potential cumulative effects for the Rathlin Island and Torr Head zone including:

- Effects on benthic ecology from substratum loss and disturbance from piled foundations and gravity bases.
- The presence of important seabird populations and breeding colonies.
- Potential for piling and operational noise from tidal developments located around Rathlin Island to affect marine mammals, marine reptiles and fish and potentially cause a barrier to movement of marine mammals and fish around Rathlin Island and through the channel between the island and the mainland.
- Potential displacement of fishermen from traditional fishing grounds in particular scallop, lobster and crab potting areas.

- The close proximity to main shipping channels could reduce navigational safety and restrict navigation channels.
- Offshore wind developments in this zone could affect the seascape value of Antrim Coast and Glens AONB.

It is considered that the various marine energy industries are not incompatible in this area, and that potential effects on European Sites can be adequately controlled through existing mechanisms. DETI have recently released Regional Locational Guidance (RLG) for offshore renewable energy developments in Northern Ireland waters (September 2011) which provides non-statutory guidance and information on the opportunities for, and key considerations influencing the siting and consenting of offshore renewable energy developments in Northern Ireland waters, including the Rathlin Island and Torr Head tidal resource zone.

While the operation, maintenance and decommissioning of marine renewable energy developments will introduce noise into the marine environment, these are typically of low intensity. The greatest noise levels arise during the construction phase, and it is these which have the greatest potential for acoustic disturbance effects (see Faber Maunsell & Metoc 2007, DECC 2009b, 2011). 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. Mono-pile foundations are the most commonly used for offshore windfarm developments at present, and are likely to be widely utilised in Round 3 and initial Scottish territorial water developments.

In relation to offshore pile-driving, standard conditions on consents for Round 2 offshore wind farms (and anticipated for Round 3 zones) 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 licensing of the Northern Ireland Blocks under consideration and future marine renewable energy development, there are a variety of other existing (e.g. shipping, fishing, military exercise areas) 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. 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 Assessments.

The Marine Strategy Framework Directive (2008/56/EC) (MSFD) requires that the European Commission (by 15 July 2010) should lay down criteria and methodological standards to allow consistency in approach in evaluating the extent to which Good Environmental Status (GES) is being achieved. ICES and JRC were contracted to provide

scientific support for the Commission in meeting this obligation. A total of 10 reports have been prepared relating to the descriptors of GES listed in Annex I of the Directive.

Task Group 11 reported on underwater noise and other forms of energy (Tasker *et al*. 2010). The Task Group developed three possible indicators of underwater sound. In no case was the Task Group able to define precisely (or even loosely) when Good Environmental Status occurs on the axes of these indicators. This is partly to do with insufficient evidence and recognised scientific challenges but also to no fully accepted definition of when, for example, a behavioural change in an organism is not good.

DECC is cognisant of the ongoing MSFD Task Group 11 work to determine criteria for an indicator relating to high amplitude, low and mid-frequency impulsive anthropogenic sounds including those from pile driving, seismic surveys and some sonar systems. DECC will review the findings of this Task Group closely with respect to consenting of relevant activities which may result from the draft plan/programme, as well as other activities which generate noise in the marine environment. The establishment of noise criteria and the consenting of activities will require a coordinated approach across different industries and activities, possibly through the future marine planning system.

8.2 Other potential in-combination effects

8.2.1 Physical damage/change to features and habitats

Potential sources of physical disturbance to the seabed, and damage to biotopes, associated with oil and gas activities were identified by the OESEA2 as anchoring of semi-submersible rigs; wellhead placement and recovery; production platform jacket installation and piling; subsea template and manifold installation and piling; pipeline, flowline and umbilical installation and trenching and decommissioning of infrastructure (DECC 2011).

In general, cumulative effects are likely to be dominated by trawling, with potential scour and physical damage from cable laying associated with potential offshore wind and marine renewable developments likely to be more important in the future.

Given the forecast scale of activity, it is likely that there will be considerable spatial and temporal separation between disturbance “footprints” and a low probability of incremental overlap of affected areas. Recovery of affected seabed through sediment mobility, and faunal recovery and recolonisation is expected to be rapid (less than five years) where the source of effects is transient (e.g. anchoring).

8.2.2 Physical presence

Physical presence of offshore infrastructure and support activities may also potentially cause behavioural responses in fish, birds and marine mammals. Previous SEAs have considered the majority of such interactions resulting from interactions with offshore oil and gas infrastructure (whether positive or negative) to be insignificant; in part because the number of surface facilities is relatively small (of the order of a few hundred) and because the majority are at a substantial distance offshore.

The larger numbers of individual surface or submerged structures associated with offshore wind developments, the presence of rotating turbine blades and considerations of their location and spatial distribution (e.g. in relation to coastal breeding or wintering locations for waterbirds and important areas for marine mammals), indicate a higher potential for physical presence effects. Potential displacement and barrier effects will likely be an important consideration at the project level for the large offshore wind developments that

are planned in the region and will likely form an important part of associated Habitats Regulations Assessments.

8.2.3 Marine discharges

As described in Section 6.3, most studies of produced water toxicity and dispersion, in the UK and elsewhere have concluded that the necessary dilution to achieve a No Effect Concentration (NEC) would be reached at <10 to 100m and usually less than 500m from the discharge point. Given the absence of existing oil and gas installations within the region and the presumption against the discharge to sea of produced water from new developments, there is unlikely to be a cumulative effect from multiple produced water discharges.

Previous discharges of WBM cuttings in the UKCS have been shown to disperse rapidly and to have minimal ecological effects (Section 6.3). Dispersion of further discharges of mud and cuttings could lead to localised accumulation in areas where reduced current allows the particles to settle on the seabed. However, in view of the scale of the region, the water depths and currents, and probability of reinjection of drill cuttings from any major field development, this is considered unlikely to be detectable and to have negligible cumulative ecological effect (DECC 2011).

8.3 Conclusions

Available evidence from other areas of the UKCS (e.g. the Moray Firth) 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.

The competent authorities will assess the potential for in-combination effects during Habitats Regulations Assessments of project specific consent applications; this process will ensure that mitigation measures are put in place to ensure that subsequent to licensing, specific projects (if consented) will not result in adverse effects on integrity of European sites. Therefore, bearing this in mind, it is concluded that the in-combination of effects from activities arising from the licensing of Blocks 125/18, 125/19, 125/20, 125/23, 125/24 and 125/25 with those from existing and planned activities will not cause an adverse effect on the integrity of the relevant European Sites.

9 Consideration of sites not yet submitted to the EC

9.1 Northern Ireland

The Skerries and Causeway draft SAC site is located adjacent to the coastline of Portstewart, Portrush, Bushmills and the Giant's Causeway World Heritage Site and covers an area of approximately 137km^2 (including areas covered by the Blocks). The area is subject to strong tidal streams and highly exposed to wave action, resulting in mobile sand offshore with sand scour dominating the biological community composition. The site has been designated for the habitats 'reefs', 'sandbanks which are slightly covered by seawater all the time' and 'submerged or partial submerged sea caves' and harbour porpoise.

Although the numbers of harbour porpoise are relatively small, monitoring has shown there to be a permanent presence within the boundary area. Calves and juveniles are regularly recorded in the area indicating that this site may be an important harbour porpoise nursery ground. Harbour seal and grey seal are additional features of the site.

The Maidens draft SAC is a group of rocky reefs detached from the coast, north east of Larne covering approximately 98km^2. The nearest part to the mainland is the south western edge of the proposed boundary that is approximately parallel to the coast and around 5km out.

The primary reason for the proposed designation of The Maidens as an SAC is for the Annex I habitat reef. Most of the reef area is bedrock reef with a smaller proportion of stony reef. However, from the multibeam echo sounding (MBES) survey analysis, some of the area has been classified as 'rock with sand infill'. While it is suggested that most of this 'rock with sand infill' should be classed as Annex I reef (because the ground truthing suggests that a mobile sand veneer would cover and uncover much of that reef area), other smaller areas have been shown by ground truthing to be shallow water stable sediments including maerl and other long lived species and have therefore been classed as Annex I sandbank slightly covered by sea water all of the time.

Grey seal is included as a secondary interest feature of The Maidens draft SAC. Surveys have shown there to be frequently around 70 grey seals hauled out on the rocks around The Maidens, and while it does not seem to be an important pupping ground, it is suggested that it may be a valuable area for nonbreeding haul-outs and for accessing feeding grounds.

The conservation objectives for both SACs are as follows:

- To avoid deterioration of the qualifying habitats and 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 habitats that the following are maintained in the long term, subject to natural change:
    - Extent of the habitats on site
    - Distribution of the habitats within the 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 habitat
- No disturbance of typical species of the habitat

Relevant NIEA non-statutory advice for both sites includes:

- Civil engineering - The construction and maintenance of structures, both within and adjacent to the sea, have the potential to cause direct loss or deterioration of qualifying habitats and communities. An example of this may be coastal defence structures that may change local patterns of sediment suspension or deposition. Other examples include: renewable and other energy installations; pipelines and cables; and marina and harbour developments.
- Commercial vessels - The pumping of bilges, discharge of ballast water, accidental grounding, or accidental oil (or other chemical) spillage from commercial vessels could occur close to the SAC. Such incidents have the potential to cause deterioration of qualifying habitats and communities through direct or indirect impacts. Emergency and oil spillage contingency plans should take into account specific qualifying interests and recognise the importance of marine SACs should such incidents occur.
- Boat anchorages and moorings - Anchors and moorings have the potential to cause deterioration of qualifying habitats and communities through the direct impact of riser chains.

For the Skerries and Causeway dSAC, the main threats to harbour porpoise populations are generally thought to be by-catch in commercial fisheries and disturbance by waterborne recreational and commercial shipping.

Therefore, activities resulting from licensing of the Blocks could potentially adversely impact the conservation objectives of the draft SACs through:

- Physical damage to the seabed (e.g. from anchoring, drilling, pipelines) causing loss or deterioration of qualifying habitats and communities.
- Marine discharges (e.g. accidental oil or chemical spillage) causing deterioration of qualifying habitats and communities.
- Underwater noise (e.g. from rig site survey, drilling, vessels) causing disturbance to marine mammals.

Following licensing, specific activities require permitting and those considered to present a risk to European Sites would be evaluated by DECC under mandatory contingency planning and Habitats Regulations Assessment procedures which will allow mitigation measures to be defined (including conditions attached to consents/permits or potentially consent/permit refusal). Consent for activities will not be granted unless the operator can demonstrate that the proposed activities will not have an adverse affect on the site integrity of relevant sites not yet submitted to the EC.

9.2 Scotland

Following a recent consultation[12], East Mingulay in the Outer Hebrides was ratified as a candidate Special Area of Conservation for its Annex I reef habitat in mid September 2011.

[12] SNH website - http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/site-consultations/

Given its distance from the Blocks and the relative insensitivity of the reef habitat to oil and gas activities that could be carried out in the Blocks (and associated mitigation measures), licensing of the Blocks will not affect the site integrity of the site.

The Sound of Barra was consulted on as a possible SAC for harbour seals and sandbanks in 2000 and subsequently re-surveyed in 2006 for Annex I habitats, to quantify areas of habitat which were of European importance. As a result, a wider area is being proposed for a range of habitats and species including sandbanks which are slightly covered by sea water all the time, reefs and harbour seal. The consultation to designate the pSAC will run between September and December 2011. Given the distance from the Blocks, licensing of the Blocks is unlikely to significantly impact the harbour seals within the pSAC as the received sound level for a typical seismic survey would be 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.

Following licensing, specific activities require permitting and those considered to present a risk to European Sites would be evaluated by DECC under mandatory contingency planning and Habitats Regulations Assessment procedures which will allow mitigation measures to be defined (including conditions attached to consents/permits or potentially consent/permit refusal). Consent for activities will not be granted unless the operator can demonstrate that the proposed activities will not have an adverse affect on the site integrity of relevant sites not yet submitted to the EC.

9.3 Offshore

The Pisces Reef Complex dSAC is being considered for its Annex I reef habitats. The site is well to the south east of the blocks applied for, and emissions or discharges from routine operations would not result in a detrimental change to the extent, physical structure, diversity, community structure and typical species representative of reefs, nor compromise the maintenance or restoration of these features for their respective sites. Licensing of the Blocks would not result in any activities that would hinder efforts to maintain the qualifying Annex I habitat features in favourable condition.

10 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 125/18, 125/19, 125/20, 125/23, 125/24 and 125/25 (considered further in Sections 6-9). This is because there is certainty, within the meaning of the ECJ Judgment in the ***Waddenzee*** case, that implementation of the plan 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 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 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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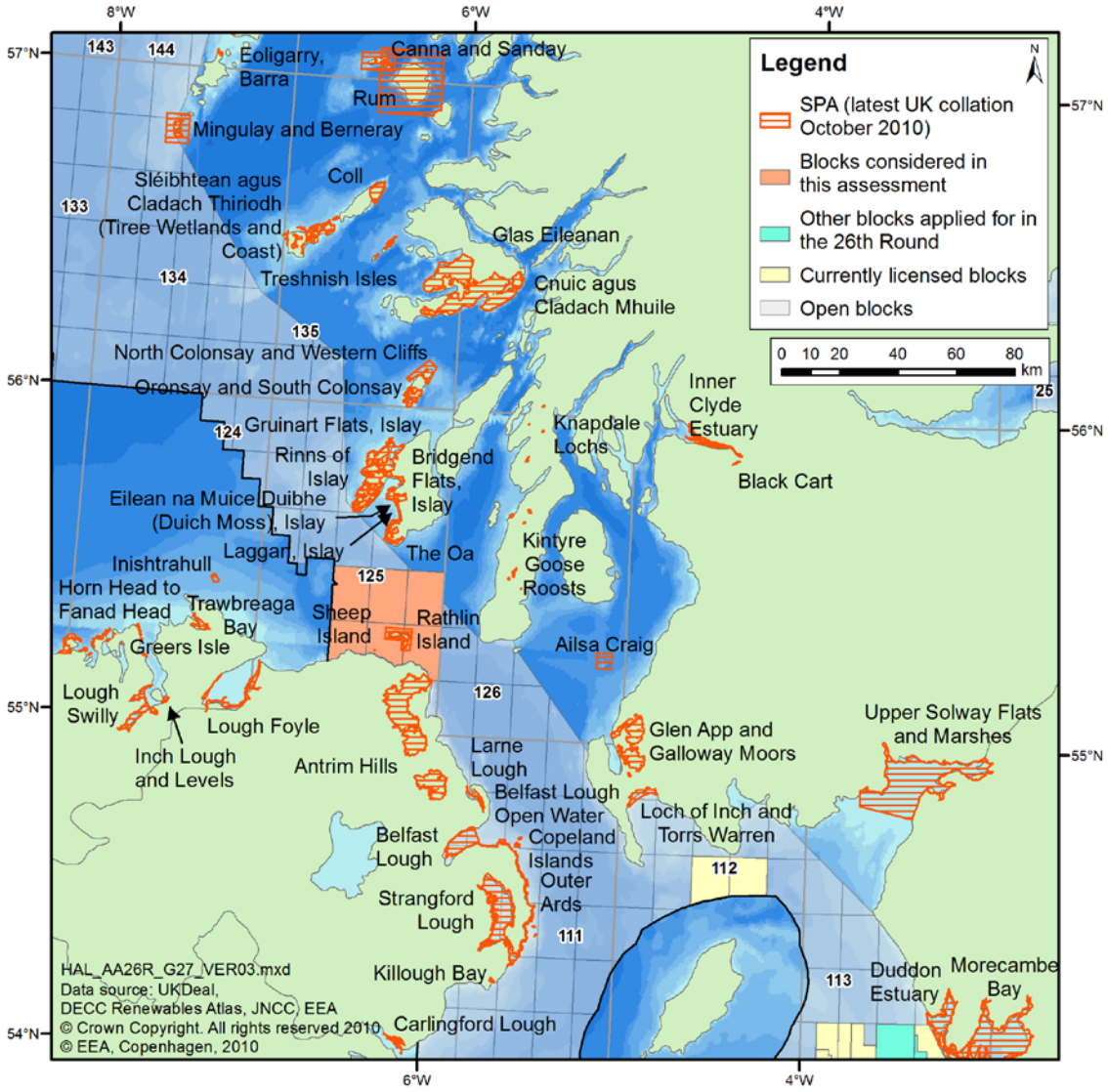
Appendix A - The sites

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

A1 Coastal and Marine Special Protection Areas

Map A.1: Location of Special Protection Areas



Box A.1: Migratory and/or Annex I bird species for which SPAs are selected in 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*
Black guillemot *Cepphus grylle*
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*
Bittern *Botaurus stellaris*

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*
Little egret *Egretta garzetta*

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*
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: SPAs and their Qualifying Features

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory species	Article 4.2 Assemblages[13]
Northern Ireland				
Lough Foyle SPA	2204.36	Over winter: Bar-tailed godwit Bewick's swan Golden plover Whooper swan	Over winter: Canadian light-bellied brent goose	Overwinter: Waterfowl
Sheep Island SPA	3.5	Breeding: Cormorant	N/A	N/A
Rathlin Island SPA	3344.62	Breeding: Peregrine	Breeding: Guillemot Razorbill Kittiwake	Breeding: Seabird
Antrim Hills SPA	27093.13	Breeding: Hen harrier Merlin	N/A	N/A
Larne Lough SPA	395.94	Breeding: Common tern Roseate tern	Over winter: Canadian light-bellied brent goose	N/A
Belfast Lough Open Water SPA	5592.99	N/A	Over winter: Great crested grebe	N/A
Belfast Lough SPA	432.14	Over winter: Bar-tailed godwit	Over winter: Redshank Turnstone	Overwinter: Waterfowl
Copeland Islands SPA	201.52	Breeding: Arctic tern	Breeding: Manx shearwater	N/A
Outer Ards SPA	1410.41	Breeding: Arctic tern Over winter: Golden plover	N/A	N/A
Strangford Lough SPA	15580.79	Breeding: Arctic tern Common tern Sandwich tern	Over winter: Knot Canadian light-bellied brent goose Redshank	Over winter: Waterfowl
Killough Bay SPA	104.23	N/A	Over winter: Canadian light-bellied brent goose	N/A
Carlingford Lough SPA	827.12	Breeding: Common tern Sandwich tern	N/A	N/A
Scotland				
Eoligarry, Barra SPA	144.04	Breeding: Corncrake	N/A	N/A
Canna and Sanday SPA	6566.8	N/A	N/A	Breeding: Seabird
Rum SPA	46716.21	Breeding: Red throated-diver	Breeding: Manx shearwater	Breeding: Seabird
Mingulay and Berneray SPA	7801.72	N/A	Breeding: Razorbill Fulmar Shag Kittiwake Guillemot	N/A

[13] - A seabird assemblage of international importance. The area regularly supports at least 20,000 seabirds. Or
- A wetland of international importance. The area regularly supports at least 20,000 waterfowl.

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory species	Article 4.2 Assemblages[13]
Sléibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast) SPA	1938.59	Overwinter: Greenland white-fronted goose Barnacle goose	Breeding: Dunlin Oystercatcher Redshank Ringed Plover Overwinter: Turnstone Ringed plover	
Coll SPA	2321.88	Overwinter: Greenland white-fronted goose Barnacle goose	N/A	N/A
Treshnish Isles SPA	240.67	Breeding: Storm petrel Overwinter: Greenland barnacle goose	N/A	N/A
Glas Eileanan SPA	1.43	Breeding: Common tern	N/A	N/A
Cnuic agus Cladach Mhuile (Mull Coast and Hills) SPA	29248.97	Resident: Golden eagle	N/A	N/A
North Colonsay and Western Cliffs SPA	3307.22	Breeding: Chough Overwinter: Chough	N/A	Breeding: Seabird
Oronsay and South Colonsay SPA	2016.86	Breeding: Corncrake Chough Overwinter: Chough	N/A	N/A
Gruinart Flats, Islay SPA	3261.32	Overwinter: Barnacle goose Greenland white-fronted goose	Overwinter: Canadian light-bellied brent goose	N/A
Rinns of Islay SPA	9407.46	Breeding: Chough Corncrake Hen harrier On passage: Whooper swan Overwinter: Greenland white-fronted goose	Breeding: Common scoter	N/A
Eilean na Muice Duibhe (Duich Moss), Islay SPA	576.42	Overwinter: Greenland white-fronted goose	N/A	N/A
Laggan, Islay SPA	1230.02	Overwinter: Barnacle goose Greenland white-fronted goose	N/A	N/A
The Oa SPA	1943	Breeding: Chough	N/A	N/A
Bridgend Flats, Islay SPA	331.16	Overwinter: Barnacle goose	N/A	N/A

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory species	Article 4.2 Assemblages[13]
Knapdale Lochs SPA	112.39	Breeding: Black-throated diver	N/A	N/A
Kintyre Goose Roosts SPA	412.37	Overwinter: Greenland white-fronted goose	N/A	N/A
Inner Clyde Estuary SPA	1826.02	N/A	Overwinter: Redshank	N/A
Black Cart SPA	56.3	Overwinter: Whooper swan	N/A	N/A
Ailsa Craig SPA	2759.57	N/A	Breeding: Razorbill Gannet Lesser black-backed gull	N/A
Glen App-Galloway Moors SPA	8942.38	Breeding: Hen harrier	N/A	N/A
Loch of Inch & Torrs Warren SPA	2111.04	Over winter: Greenland white-fronted goose Hen harrier	N/A	N/A
Upper Solway Flats and Marshes SPA	30706.26	Over winter: Bar-tailed godwit Barnacle goose Golden plover Whooper swan	Over winter: Curlew Dunlin Sanderling Knot Oystercatcher Pink-footed goose Pintail Redshank Shoveler Teal Turnstone Scaup Goldeneye Grey plover Shelduck	Over winter: Waterfowl
England				
Duddon Estuary SPA	6806.3	Breeding: Sandwich tern	Over winter: Knot Pintail Redshank	Over winter: Waterfowl
Morecambe Bay SPA	37404.6	Breeding: Sandwich tern	On passage: Ringed plover Over winter: Curlew Dunlin Grey plover Knot Oystercatcher Pink-footed goose Pintail Redshank Shelduck Turnstone Bar-tailed godwit	Breeding: Seabird

A2 SPAs in adjacent member states

See Map A1 for details of site locations.

Table A.2: SPAs and their Qualifying Features in the Republic of Ireland

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory species	Article 4.2 Assemblages[14]
Horn Head to Fanad Head SPA	2430.70	Overwinter: Greenland white-fronted goose Whooper Swan Greenland Barnacle goose Peregrine Chough Breeding: Peregrine Chough	Overwinter: Teal Mallard Tufted duck Pochard Coot Breeding: Common sandpiper Razorbill Dunlin Puffin Fulmar Snipe Herring gull Shag Cormorant Kittiwake Guillemot Lapwing	N/A
Lough Swilly SPA	3734.44	Overwinter: Whooper Swan Greenland white-fronted goose Bar-tailed godwit Golden plover	Overwinter: Great crested grebe Shelduck Wigeon Teal Mallard Scaup Shoveler Goldeneye Red-breasted merganser Coot Oystercatcher Knot Dunlin Curlew Redshank Greenshank Brent goose Pochard Tufted duck Lapwing Ringed plover Grey plover	Overwinter: Waterfowl
Greers Isle SPA	19.14	Breeding: Sandwich tern Common tern Arctic tern	Breeding: Common gull Black-headed gull	N/A
Trawbreaga Bay SPA	1003.4	Overwinter: Barnacle goose Whooper Swan Bar-tailed godwit	N/A	N/A

[14] - A seabird assemblage of international importance. The area regularly supports at least 20,000 seabirds. Or
- A wetland of international importance. The area regularly supports at least 20,000 waterfowl.

Site Name	Area (ha)	Article 4.1 Species	Article 4.2 Migratory species	Article 4.2 Assemblages[14]
Inishtrahull SPA	474.45	Overwinter: Barnacle goose	Breeding: Shag Common gull Lesser black-backed gull Fulmar Lesser black-backed gull	N/A
Lough Foyle SPA	587.93	N/A	Overwinter: Great crested grebe Cormorant Brent goose Shelduck Wigeon Mallard Red-breasted merganser Oystercatcher Ringed plover Knot Curlew Redshank Greenshank Turnstone Black-headed gull Common gull	N/A

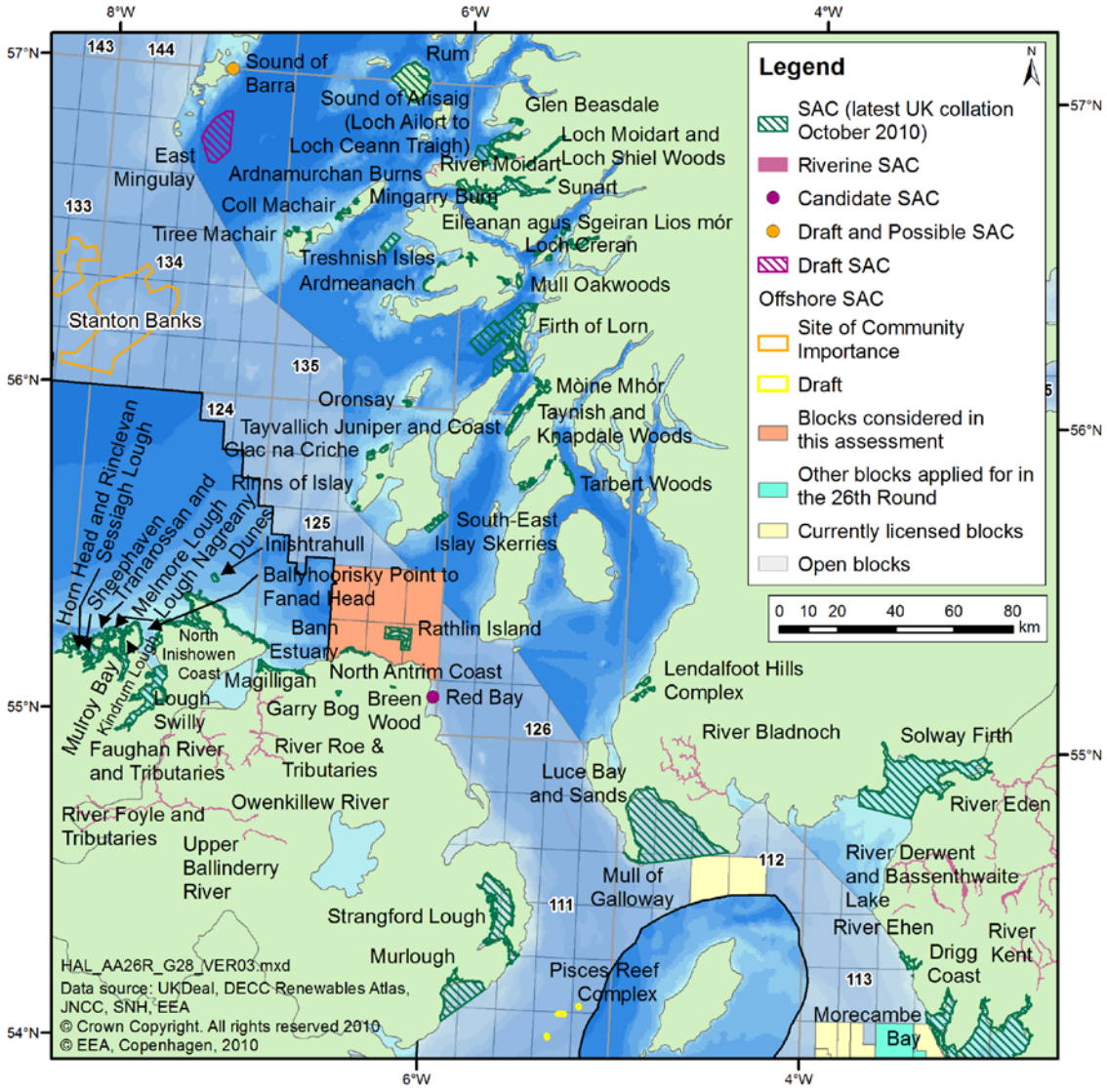
A3 Coastal and Marine Special Areas of Conservation

This section includes coastal or nearshore marine (within 12nm boundary) Special Areas of Conservation (SAC) sites which contain one or more of the Annex I coastal habitats listed in Box A.2 (below) or examples of Annex II qualifying marine species.

Abbreviations for the Annex 1 habitats used in SAC site summaries (Tables A.3, A.4, A.5 and A.6 and Map A.2) are listed in Box A.2.

Relevant offshore (out with or crossing the 12nm boundary) SACs are included on Map A.2 and described in Section A4. Riverine/freshwater SACs which are designated for migratory fish and/or freshwater pearl mussel are included on Map A.2 and considered in Section A5.

Map A.2: Location of coastal, marine and offshore 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 Bog Woodland * Priority feature Degraded raised bogs still capable of natural regeneration Depressions on peat substrates of the *Rhynchosporion* Transition mires and quaking bogs
Caves	Caves not open to the public
Coastal dunes	Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) Coastal dunes with *Juniperus* spp. Decalcified fixed dunes with *Empetrum nigrum* Dunes with *Hippophae rhamnoides* Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) Embryonic shifting dunes Fixed dunes with herbaceous vegetation (`grey dunes`) * Priority feature Humid dune slacks Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`)
Coastal lagoons	Coastal lagoons *Priority feature
Estuaries	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 *Tilio-Acerion* forests of slopes, screes and ravines * Priority feature Killarney fern *Trichomanes speciosum* Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) *Asperulo-Fagetum* beech forests Old acidophilous 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*

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

Table A.3: Coastal 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
Northern Ireland					
Magilligan SAC	1058.22	Coastal dunes	Coastal dunes	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia* Petalwort *Petalophyllum ralfsii*
Bann Estuary SAC	347.94	Coastal dunes	Salt marshes and salt meadows Coastal dunes	N/A	N/A
North Antrim Coast SAC	314.59	Sea cliffs	Vegetation of drift lines Salt marshes and salt meadows Coastal dunes Grasslands	Narrow-mouthed whorl snail *Vertigo angustior*	N/A
Garry Bog SAC	154.76	Bogs	N/A	N/A	N/A
Rathlin Island SAC	3344.62	Reefs Sea cliffs Sea caves	Sandbanks Vegetation of drift lines	N/A	N/A
Breen Wood SAC	36.01	Forests	Bogs	N/A	N/A
Red Bay SCI	965.54	Sandbanks	N/A	N/A	N/A
Strangford Lough SAC	15398.54	Mudflats and sandflats Coastal lagoons Inlets and bays Reefs	Vegetation of drift lines Vegetation of stony banks Salt marshes and salt meadows	N/A	Harbour seal *Phoca vitulina*
Murlough SAC	11902.03	Coastal dunes	Sandbanks Mudflats and sandflats Salt marshes and salt meadows Coastal dunes	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*	Harbour seal *Phoca vitulina*
Scotland					
Sound of Barra pSAC	5279	Sandbanks	N/A	N/A	N/A
East Mingulay pSAC	12557.26	Reefs	N/A	N/A	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Rum SAC	10835.33	Standing freshwater Heaths Grasslands Scree	Sea cliffs Heaths Grasslands Bogs Fens Scree Rocky slopes	Otter *Lutra lutra*	N/A
Sound of Arisaig (Loch Ailort to Loch Ceann Traigh) SAC	4556.65	Sandbanks	N/A	N/A	N/A
Coll Machair SAC	851.33	Coastal dunes Machairs	Coastal dunes Standing freshwater	Slender naiad *Najas flexilis*	N/A
Tiree Machair SAC	785.46	Coastal dunes Machairs Standing freshwater	Coastal dunes	N/A	N/A
Glen Beasdale SAC	507.32	Forest	N/A	N/A	Freshwater pearl mussel *Margaritifera margaritifera* Otter *Lutra lutra*
Loch Moidart and Loch Shiel Woods SAC	1756.77	Forests	Mudflats and sandflats Forests	N/A	Otter *Lutra lutra*
Sunart SAC	10246.72	Forest	Reefs Heath Forest	Otter *Lutra lutra*	N/A
Eileanan agus Sgeiran Lios mór SAC	1139.62	N/A	N/A	Harbour seal *Phoca vitulina*	N/A
Loch Creran SAC	1226.39	Reefs	N/A	N/A	N/A
Treshnish Isles SAC	1962.66	N/A	Reefs	Grey seal *Halichoerus grypus*	N/A
Ardmeanach SAC	374.79	Grassland	Sea cliffs	N/A	N/A
Mull Oakwoods SAC	1401.89	Forest	N/A	N/A	Otter *Lutra lutra*
Firth of Lorn SAC	20975.01	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
Moine Mhor SAC	1150.41	Bogs	Mudflats and sandflats Salt marshes and salt meadows Forest		Otter *Lutra lutra* Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*
Taynish and Knapdale Woods SAC	966.27	Forests	Standing freshwater	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*	Otter *Lutra lutra*
Tarbert Woods SAC	1595.97	Forests	N/A	N/A	N/A
Oronsay SAC	340.07	Machairs	N/A	N/A	N/A
Tayvallich Juniper and Coast SAC	1213.47	Scrub (matorral)	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*	Otter *Lutra lutra*
Glac na Criche SAC	265.33	Bogs	Sea cliffs Heaths	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*
Rinns of Islay SAC	1149.7	N/A	N/A	Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*	N/A
South-East Islay Skerries SAC	1498.3	N/A	N/A	Harbour seal *Phoca vitulina*	N/A
Lendalfoot Hills Complex SAC	1309.71	Grassland Fens	Heaths Grasslands Bogs	N/A	N/A
Luce Bay and Sands SAC	48759.28	Inlets and bays Coastal dunes	Sandbanks Mudflats and sandflats Reefs	N/A	Great crested newt *Triturus cristatus*
Mull of Galloway SAC	136.39	Sea cliffs	N/A	N/A	N/A
Solway Firth SAC	43636.72	Sandbanks Estuaries Mudflats and sandflats Salt marshes and salt meadows	Reefs Vegetation of stony banks Coastal dunes	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*	N/A

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
England					
Drigg Coast SAC	1397.44	Estuaries Coastal dunes	Mudflats and sandflats Salt marshes and salt meadows Coastal dunes	N/A	N/A
Morecambe Bay SAC	61506.22	Estuaries Mudflats and sandflats Inlets and bays Vegetation of stony banks Salt marshes and salt meadows Coastal dunes	Sandbanks Coastal lagoons Reefs Coastal dunes	Great crested newt *Triturus cristatus*	N/A

A4 Offshore Special Areas of Conservation

The locations of relevant offshore Special Areas of Conservation are detailed on Map A.2 above.

Table A.4: Offshore SACs and their Qualifying Features from Northern Ireland

Site Name	Area (ha)	Annex I Habitat	Annex II Species
Stanton Bank SCI	81,727	Reefs	N/A
Pisces Reef Complex	697.35	Reefs	N/A

A5 Riverine and Freshwater Special Areas of Conservation

The following riverine and freshwater SACs designated for migratory fish and/or the freshwater pearl mussel are also considered. The locations of relevant Special Areas of Conservation are detailed on Map A.2 above.

Table A.5: Relevant riverine and freshwater SACs designated for migratory fish and/or the freshwater pearl mussel

Site Name	Freshwater pearl mussel *Margaritifera margaritifera*	Migratory fish[1]
Northern Ireland		
River Faughan and Tributaries		AS
River Foyle and Tributaries		AS
Upper Ballinderry River	✓	-
Owenkillew River	✓	AS
River Roe and Tributaries		AS

Site Name	Freshwater pearl mussel *Margaritifera margaritifera*	Migratory fish[1]
Scotland		
Ardnamurchan Burns	✓	-
Mingarry Burn	✓	-
River Moidart	✓	-
River Bladnoch		AS
Endrick Water		RL, AS
England		
River Eden		SL, RL, AS
River Derwent & Bassenthwaite Lake		SL, RL, AS
River Ehen	✓	AS
River Kent	✓	-
Republic of Ireland		
River Finn		AS

[1] *SL - Sea lamprey Petromyzon marinus, RL - River lamprey Lampetra fluviatilis, AS - Atlantic salmon Salmo salar*

A6 SACs in adjacent member states

See Map A2 for details of site locations.

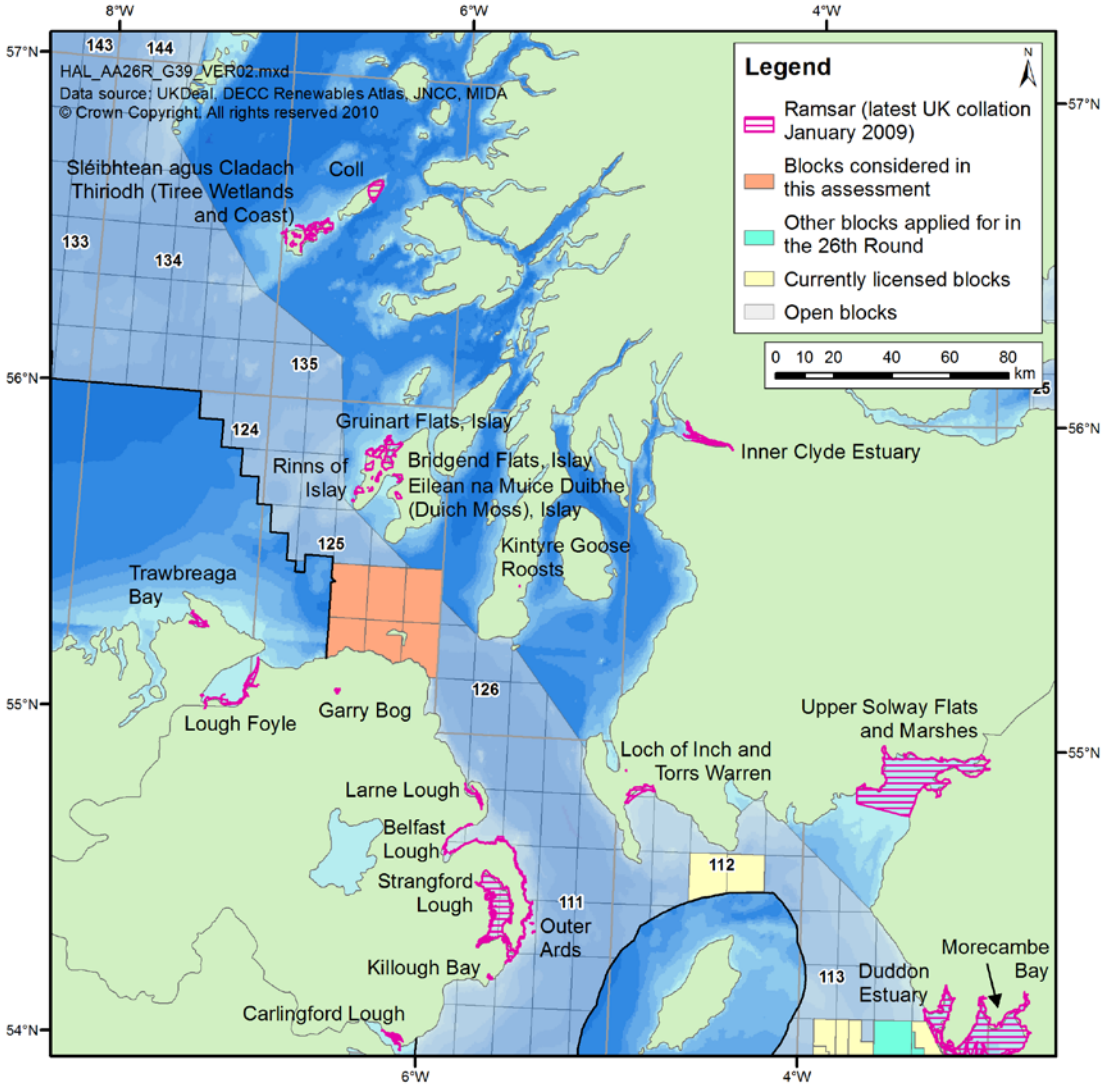
Table A.6: Coastal SACs and their Qualifying Features in the Republic of Ireland

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Horn Head and Rinclevan SAC	2344.32	Coastal dunes Machairs	N/A	N/A	Grey seal *Halichoerus grypus* whorl snail *Vertigo geyeri* Petalwort *Petalophyllum ralfsii* Slender naiad *Najas flexilis*
Sessiagh Lough SAC	72.2	Standing freshwater	N/A	N/A	Slender naiad *Najas flexilis*
Sheephaven SAC	1841.97	Mudflats and sandflats	Mudflats and sandflats Salt marshes and salt meadows Forest dunes	N/A	Petalwort *Petalophyllum ralfsii*

Site Name	Area (ha)	Annex 1 Habitat Primary	Annex 1 Habitat Qualifying	Annex II Species Primary	Annex II Species Qualifying
Tranarossan and Melmore Lough SAC	653.63	Standing freshwater Sea cliffs Coastal dunes	Mudflats and sandflats Vegetation of stony banks Vegetation of drift lines Heaths	N/A	Petalwort *Petalophyllum ralfsii*
Mulroy Bay SAC	3209.14	Inlets and bays Reefs	N/A	N/A	Otter *Lutra lutra*
Kindrum Lough SAC	116.10	Standing freshwater	N/A	N/A	Slender naiad *Najas flexilis*
Ballyhoorisky Point to Fanad Head	1293.04	Sea cliffs	Standing freshwater Vegetation of stony banks	N/A	Narrow-mouthed whorl snail *Vertigo angustior*
Lough Nagreany dunes SAC	221.15	Coastal dunes		N/A	Slender naiad *Najas flexilis*
North Inishowen Coast SAC	6290.80	Mudflats and sandflats	N/S	N/A	Otter *Lutra lutra*
Inishtrahull SAC	471.22	Sea cliffs	N/A	N/A	N/A
Lough Swilly SAC	9262.71	Coastal lagoons Estuaries	N/A	N/A	Otter *Lutra lutra* Spartina swards *Spartinion maritimae*

A7 RAMSAR Sites

Map A.3: Location of coastal Ramsar sites



The coastal Ramsar sites are also SPA.s and/or SACs (although site boundaries are not always strictly coincident and a Ramsar site may comprise one or more Natura 2000 sites), see tabulation below.

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

Ramsar Name	SPA Name	SAC Name
Belfast Lough	Belfast Lough	
	Belfast Lough Open Water	
	Outer Ards	
Bridgend Flats, Islay	Bridgend Flats, Islay	
Carlingford Lough	Carlingford Lough	
Coll	Coll	
Duddon Estuary	Duddon Estuary	Morecambe Bay

Ramsar Name	SPA Name	SAC Name
Duddon Estuary	Morecambe Bay	
Eilean na Muice Duibhe (Duich Moss), Islay	Eilean na Muice Duibhe (Duich Moss), Islay	
Garry Bog		Garry Bog
Gruinart Flats, Islay	Gruinart Flats, Islay	Rinns of Islay
	Rinns of Islay	
Inner Clyde Estuary	Inner Clyde Estuary	
Killough Bay	Killough Bay	
Kintyre Goose Roosts	Kintyre Goose Roosts	
Larne Lough	Larne Lough	
Loch of Inch and Torrs Warren	Loch of Inch and Torrs Warren	Luce Bay and Sands
Lough Foyle		Faughan River and Tributaries
		Magilligan
Morecambe Bay	Duddon Estuary	Morecambe Bay
Outer Ards	Belfast Lough	Strangford Lough
	Outer Ards	
	Strangford Lough	
Rinns of Islay	Rinns of Islay	Glac na Criche
		Rinns of Islay
Sléibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast)	Sléibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast)	Tiree Machair
Strangford Lough	Outer Ards	
	Strangford Lough	Strangford Lough
Trawbreaga Bay	Trawbreaga Bay	
Upper Solway Flats and Marshes	Upper Solway Flats and Marshes	River Eden
		Solway Firth

Appendix B – Screening tables for identification of likely significant 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	
Northern Ireland								
Lough Foyle	-	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (overwintering waterfowl and geese), although mitigation would be possible and residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific 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	
Sheep Island	✓	-	-	✓	✓			Several blocks are within or adjacent to the SPA. Certain activities in, or related to, these blocks could potentially affect conservation objectives through physical damage or loss from smothering by drilling discharges, the installation of infrastructure and cables. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding cormorant). However, mitigation would be possible and the cormorants predominantly feed on inland rivers and lakes. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Rathlin Island	✓	-	-	✓	✓			Several blocks are within or adjacent to the SPA. Certain activities in, or related to, these blocks could potentially affect conservation objectives through physical damage or loss from smothering by drilling discharges, the installation of infrastructure and cables. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding guillemot, razorbill and kittiwake) when foraging within and outwith the boundaries of the SPA, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Antrim Hills	✓	-	-		✓			Block 125/25 is adjacent to the terrestrial SPA. Certain activities in, or related to, the block could potentially affect conservation objectives through physical damage or loss from the potential installation of associated terrestrial infrastructure and cables. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil is not likely to affect the qualifying features (breeding hen harrier and merlin) as no marine component to site.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
Larne Lough	✓	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding terns and overwintering geese), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Belfast Lough Open Water	-	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying feature (overwintering great crested grebe), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Belfast Lough	-	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (overwintering waterfowl)., although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Copeland Islands	✓	-	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding puffin and tern) when foraging within and outwith the boundaries of the SPA, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
								summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Outer Ards	✓	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Strangford Lough	✓	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Killough Bay	-	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Carlingford Lough	✓	-	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Scotland								
Eoligarry, Barra	✓	-	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Canna and Sanday	✓	-	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Rum	✓	-	-					Site is remote from blocks and its conservation objectives 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	
Mingulay and Berneray	✓	-	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Sleibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast)	✓	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Coll	-	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Treshnish Isles	✓	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding storm petrel) when foraging outwith the boundaries of the SPA, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Glas Eileanan	✓	-	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Cnuic agus Cladach Mhuile (Mull Coast and Hills)	✓	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
North Colonsay and Western Cliffs	✓	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding seabirds) when foraging outwith the boundaries of the SPA, although mitigation would be possible. High level

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
								mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Oronsay and South Colonsay	✓	✓	-					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil is not likely to affect the qualifying features (breeding corncrake and overwintering chough) as do not utilise marine habitats.
Gruinart Flats, Islay	-	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (overwintering geese) when foraging within the SPA, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Rinns of Islay	✓	✓	✓	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding chough, corncrake, hen harrier, common scoter, migrating whooper swan and overwintering geese) although site is predominantly non-marine in nature and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Eilean na Muice Duibhe (Duich Moss), Islay	-	✓	-					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
								from any of the Blocks, weathered spilled crude oil is not likely to affect the qualifying feature (overwintering geese) as no marine component to the site.
Laggan, Islay	-	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (overwintering geese) when foraging within the SAC, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
The Oa	✓	-	-					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil is not likely to affect the qualifying features (breeding chough) as do not utlilise marine habitats.
Bridgend Flats, Islay	-	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (overwintering geese) when foraging within the SPA, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Knapdale Lochs	✓	-	-					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil is not likely to affect the qualifying feature (breeding black-throated diver) as no marine component to the site.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
Kintyre Goose Roosts	-	✓	-					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil is not likely to affect the qualifying feature (overwintering geese) as no marine component to the site.
Inner Clyde Estuary	-	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Black Cart	-	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills
Ailsa Craig	✓	-	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding razorbill, gannet and lesser black-backed gull) when foraging within the SPA and in adjacent areas beyond the site boundaries, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Glen App and Galloway Moors	✓	-	-					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil is not likely to affect the qualifying feature (breeding hen harrier) as no marine component to the site.
Loch of Inch and Torrs Warren	-	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
Upper Solway Flats and Marshes	-	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
England								
Duddon Estuary	✓	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Morecambe Bay	✓	✓	✓					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Republic of Ireland								
Horn Head to Fanad Head	✓	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding seabirds and waterfowl, overwintering geese and waterfowl) within the site or foraging in adjacent waters outwith the site boundaries, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Lough Swilly	-	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (overwintering geese and waterfowl), although mitigation would be possible. High level mitigation measures have been

Site name	Features present[1]			Vulnerability to effects[2]				Consideration
	Breeding	Wintering	Passage	Oil spills	Physical Disturbance	Acoustic Disturbance	In-combination	
								identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Greers Isle	✓	-	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding terns and gulls) within the site or foraging in adjacent waters outwith the site boundaries, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Trawbreaga Bay	-	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (overwintering geese and waterfowl), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Inishtrahull	✓	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (breeding shag, gulls and fulmar) within the site or foraging in adjacent waters outwith the site boundaries, although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific 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	
Lough Foyle		✓		✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (overwintering waterfowl and geese), although mitigation would be possible and residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Notes: [1] ✓ denotes feature present; [2] ✓ denotes vulnerability to effect

B2 Coastal and marine Special Areas of Conservation

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Northern Ireland							
Magilligan	✓	✓					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could theoretically affect the features (coastal dunes), although features not considered particularly sensitive to spills and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
							Regulations Assessment once project plans are known.
Bann Estuary	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (salt marshes and salt meadows), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
North Antrim Coast	✓	✓	✓	✓			Several blocks are within or adjacent to the SAC. Certain activities in, or related to, these blocks could potentially affect conservation objectives through physical damage or loss from the installation of infrastructure and cables (particularly if there are terrestrial components). Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (salt marshes and salt meadows), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Garry Bog	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Rathlin Island	✓	-	✓	✓			Several blocks are within or adjacent to the SAC. Certain activities in, or related to, these blocks could potentially affect habitat features conservation objectives through physical damage or loss from smothering by drilling discharges, the installation of infrastructure and cables. In the unlikely event of a major crude oil spill from the Blocks, spilled crude oil could theoretically affect the features (reefs, sea cliffs, sea caves, sandbanks), although features not considered particularly sensitive to spills. However the variety of marine

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
							Annex I habitats and proximity of the site to the Blocks means that a spill could cause significant impact although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Breen Wood	✓	-					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Red Bay SCI	✓	-					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could theoretically affect the features (sandbanks), although features not considered particularly sensitive to spills and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Strangford Lough	✓	✓			✓		Site is remote from blocks and its integrity would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks. Certain activities (i.e. seismic surveys) may cause temporary acoustic disturbance to the species features (harbour seals) outside of the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).
Murlough	✓	✓			✓		Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks. Certain activities (i.e. seismic surveys) may cause temporary acoustic disturbance to the species features (harbour seals) outside of the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4). High level

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
							mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Scotland							
Sound of Barra pSAC	✓	-					Site is remote from blocks with limited marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
East Mingulay pSAC	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Rum	✓	✓					Site is remote from blocks with limited marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Sound of Arisaig (Loch Ailort to Loch Ceann Traigh)	✓	-					Site is remote from blocks with limited marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Coll Machair	✓	✓					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Tiree Machair	✓						Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Glen Beasdale	✓	✓					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Loch Moidart and Loch Shiel Woods	✓	✓					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Sunart	✓	✓					Site is remote from blocks with limited marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Eileanan agus Sgeiran Lios mor	-	✓			✓		Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Certain activities (i.e. seismic surveys) may cause temporary acoustic disturbance to the species features (harbour seals) outside of the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4). High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Loch Creran	✓	-					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Treshnish Isles	✓	✓			✓		Conservation objectives would not be affected by emissions or discharges from routine operations. Certain activities (i.e. seismic surveys) may cause temporary acoustic disturbance to the species feature (grey seal) outside of the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4). High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Ardmeanach	✓	-					Site is remote from blocks with limited marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Mull Oakwoods	✓	✓					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Firth of Lorn	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Moine Mhor	✓	✓	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (mudflats and sandflats, salt marshes and salt meadows, otter), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Taynish and Knapdale Woods	✓	✓					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Tarbert Woods	✓	-					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Oronsay	✓	-					Site is remote from blocks with limited marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Tayvallich Juniper and Coast	✓	✓	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could affect the species features (otter), although limited marine component of site and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific 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
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Glac na Criche	✓	✓					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could theoretically affect the features (sea cliffs), although features not considered particularly sensitive to spills and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Rinns of Islay	-	✓					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could theoretically affect the species features (marsh fritillary butterfly), although the marine component of the site is limited and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
South-East Islay Skerries	-	✓	✓		✓		Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could affect the species features (harbour seal), although mitigation would be possible. Certain activities (i.e. seismic surveys) may cause temporary acoustic disturbance to the species feature (harbour seals) within and outside of the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4). High level mitigation measures have been identified in Sections 5.4 and 7.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Lendalfoot Hills Complex	✓	-					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Luce Bay and Sands	✓	✓					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Mull of Galloway	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Solway Firth	✓	✓			✓		Conservation objectives would not be affected by emissions or discharges from routine operations. Certain activities (i.e. seismic surveys) may cause temporary acoustic disturbance to the species features (sea and river lamprey) outside of the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4). High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
England							
Drigg Coast	✓	-					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Morecambe Bay	✓	✓					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any spill would travel northwards from the Blocks.
Republic of Ireland							
Horn Head and Rinclevan	✓	✓			✓		Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills. Residual currents and predominant wind direction should mean that any

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
							spill would travel northwards from the Blocks. Certain activities (i.e. seismic surveys) may cause temporary acoustic disturbance to the species features (grey seals) outside of the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4). High level mitigation measures have been identified in Section 7.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Sessiagh Lough	✓	✓					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Sheephaven	✓	✓	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (mudflats and sandflats, salt marshes and salt meadows), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Tranarossan and Melmore Lough	✓	✓	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (e.g. mudflats and sandflats), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Mulroy Bay	✓	✓	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (inlets and bays, otter), although mitigation would be possible. High

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
							level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Kindrum Lough	✓	✓					Site is remote from blocks with no marine component and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Ballyhoorisky Point to Fanad Head	✓	✓					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could theoretically affect the features (sea cliffs, vegetation of stony banks), although features not considered particularly sensitive to spills and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Lough Nagreany Dunes	✓	✓					Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could theoretically affect the features (coastal dunes), although features not considered particularly sensitive to spills and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific 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
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
North Inishowen Coast	✓	✓	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (mudflats and sandflats, otter), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Inishtrahull	✓	-	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely event of a major crude oil spill from the Blocks, weathered spilled crude oil could theoretically affect the features (sea cliffs), although features not considered particularly sensitive to spills and mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.
Lough Swilly	✓	✓	✓				Conservation objectives would not be affected by emissions or discharges from routine operations. In the unlikely events of a major crude oil spill from any of the Blocks, weathered spilled crude oil could affect the qualifying features (estuaries, otter), although mitigation would be possible. High level mitigation measures have been identified in Section 5.4 and are summarised in Table 4.2. Further, project specific mitigation measures would be defined by subsequent Habitats Regulations Assessment once project plans are known.

Notes: [1] ✓denotes feature present; [2] ✓denotes vulnerability to effect; [3] including diesel and/or lube oil

B3 Offshore Special Areas of Conservation

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Stanton Banks	✓	-	-	-	-	-	Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Pisces Reef Complex	✓	-	-	-	-	-	Site is remote from blocks and its conservation objectives 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 diesel and/or lube oil

B4 Riverine Special Areas of Conservation

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
Northern Ireland							
River Faughan and Tributaries	✓	✓			✓		Certain activities (i.e. seismic survey) could cause temporary acoustic disturbance to species features (Atlantic salmon), outside the site boundaries, although adverse effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
River Foyle and Tributaries	✓	✓	✓		✓		Site is predominantly terrestrial. However theoretically there is a possibility that the conservation objectives of the species features (otter) could be affected by emissions or discharges from routine operations or accidental spills outside the site boundaries, although mitigation would be possible. Certain activities (i.e. seismic survey) could also cause temporary acoustic disturbance to species features (Atlantic salmon), again outside the site boundaries, although adverse effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).
Upper Ballinderry River	✓	✓					Site has no marine component. As a result its conservation objectives are unlikely to be affected by discharges or from routine operations or accidental spills.
Owenkillew River	✓	✓			✓		Certain activities (i.e. seismic survey) could cause temporary acoustic disturbance to species features (Atlantic salmon), outside the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4). The gills of migratory salmonids provide an essential mode of dispersal for the larvae of the species feature (freshwater pearl mussel); despite the potential for temporary acoustic disturbance of such salmonids outside of the site boundaries, adverse effects on conservation objectives are highly unlikely.
River Roe and Tributaries	✓	✓			✓		Certain activities (i.e. seismic survey) however could cause temporary acoustic disturbance to species features (Atlantic salmon), outside the site boundaries, although adverse effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).
Scotland							
Ardnamurchan Burns	-	✓					Site is remote from blocks and conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Mingarry Burn	-	✓					Site is remote from blocks and conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
River Moidart	-	✓					Site is remote from blocks with no marine component and conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
River Bladnoch	-	✓			✓		Certain activities (i.e. seismic survey) however could cause temporary acoustic disturbance to species features (Atlantic salmon), outside the site boundaries, although adverse effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).
Endrick Water		✓			✓		Certain activities (i.e. seismic survey) could cause temporary acoustic disturbance to species features (Atlantic salmon), outside the site boundaries, although adverse effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).
England							
River Eden	✓	✓			✓		Certain activities (i.e. seismic survey) however could cause temporary acoustic disturbance to species features (Atlantic salmon, lampreys), outside the site boundaries, although effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).
River Derwent & Bassenthwaite Lake	✓	✓			✓		Certain activities (i.e. seismic survey) could cause temporary acoustic disturbance to species features (Atlantic salmon, lampreys), outside the site boundaries, although adverse effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).
River Ehen	-	✓			✓		Certain activities (i.e. seismic survey) could cause temporary acoustic disturbance to species features (Atlantic salmon), outside the site boundaries, although adverse effects on conservation objectives are unlikely (see Sections 7.3 and 7.4). The gills of migratory salmonids provide an essential mode of dispersal for the larvae of the species feature (freshwater pearl mussel); despite the potential for temporary acoustic disturbance of such salmonids outside of the site boundaries, effects on site integrity are highly unlikely.

Site name	Features present[1]		Vulnerability to effects[2]				Consideration
	Habitats	Species	Oil spills[3]	Physical Disturbance	Acoustic Disturbance	In-combination	
River Kent	✓	✓					Site is remote from blocks and its conservation objectives would not be affected by emissions or discharges from routine operations or accidental spills.
Republic of Ireland							
River Finn	✓	✓			✓		Certain activities (i.e. seismic survey) could cause temporary acoustic disturbance to species features (Atlantic salmon), outside the site boundaries, although adverse effects on conservation objectives are unlikely (see Sections 7.3 and 7.4).

Notes: [1] ✓denotes feature present; [2] ✓denotes vulnerability to effect; [3] including diesel and/or lube oil

Appendix C – Detailed information on Natura 2000 sites where the potential for effects have been identified

C1 Coastal and marine Special Protection Areas

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

Northern Ireland

Site Name: Lough Foyle SPA	
Location	Latitude 55º 05'24"N Longitude 07º 01'37"W
Area (ha)	2204.36
Summary	Lough Foyle lies on the north-west coast of Northern Ireland and straddles the international border with the Irish Republic. The site comprises a large, shallow sea lough that includes the estuaries of the rivers Foyle, Faughan and Roe. The site contains extensive intertidal mud-flats and sand-flats (with mussel *Mytilus edulis* beds), saltmarsh and associated brackish ditches. The diversity of coastal habitats has resulted in the lough being of major importance for a diverse assemblage of waterbirds both during the spring and autumn migration periods, and in winter. These include swans, geese, ducks and waders. The lough is especially notable in supporting a high proportion of the international population of Canada/Ireland light-bellied brent goose *Branta bernicla hrota*.
Qualifying features for which the site is designated:	
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: **Overwinter:** Bar-tailed godwit *Limosa lapponica*, 1,896 individuals representing 10.8% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6) Bewick's swan Cygnus *columbianus bewickii*, 78 individuals representing 3.1% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6) Golden plover *Pluvialis apricaria*, 4,891 individuals representing 2.4% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6) Whooper swan *Cygnus cygnus*, 890 individuals representing 8.9% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6) ***Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:*** **Overwinter:** Light-bellied brent goose *Branta bernicla hrota*, 3,730 individuals representing 18.6% of the wintering Canada/Ireland population (5 year peak mean 1991/2 - 1995/6) ***Under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl Assemblage qualification: A wetland of international importance.*** Over winter, the area regularly supports 37,310 individual waterfowl (5 year peak mean 1991/2 - 1995/6)	

Site Name: Lough Foyle SPA

including: teal *Anas crecca*, whooper swan *Cygnus cygnus*, golden plover *Pluvialis apricaria*, bar-tailed godwit *Limosa lapponica*, light-bellied brent goose *Branta bernicla hrota*, great crested grebe *Podiceps cristatus*, cormorant *Phalacrocorax carbo*, greylag goose *Anser anser*, Bewick's swan Cygnus *columbianus bewickii*, wigeon *Anas penelope*, redshank *Tringa totanus*, mallard *Anas platyrhynchos*, eider *Somateria mollissima*, red-breasted merganser *Mergus serrator*, oystercatcher *Haematopus ostralegus*, lapwing *Vanellus vanellus*, knot *Calidris canutus*, dunlin *Calidris alpina alpina*, curlew *Numenius arquata*, shelduck *Tadorna tadorna*.

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Component Objective
Bewick's swan wintering population	No significant decrease in population against national trends, caused by on-site factors
Whooper swan wintering population	No significant decrease in population against national trends, caused by on-site factors
Golden plover wintering population	No significant decrease in population against national trends, caused by on-site factors
Bar-tailed godwit wintering population	No significant decrease in population against national trends, caused by on-site factors
Light-bellied brent goose wintering population	No significant decrease in population against national trends, caused by on-site factors
Great crested grebe wintering population	No significant decrease in population against national trends, caused by on-site factors
Cormorant wintering population	No significant decrease in population against national trends, caused by on-site factors
Greylag goose wintering population	No significant decrease in population against national trends, caused by on-site factors
Shelduck wintering population	No significant decrease in population against national trends, caused by on-site factors
Wigeon wintering population	No significant decrease in population against national trends, caused by on-site factors
Teal wintering population	No significant decrease in population against national trends, caused by on-site factors
Mallard wintering population	No significant decrease in population against national trends, caused by on-site factors
Eider wintering population	No significant decrease in population against national trends, caused by on-site factors
Red-breasted merganser wintering population	No significant decrease in population against national trends, caused by on-site factors
Oystercatcher wintering population	No significant decrease in population against national trends, caused by on-site factors
Lapwing wintering population	No significant decrease in population against national trends, caused by on-site factors
Knot wintering population	No significant decrease in population against national trends, caused by on-site factors
Dunlin wintering population	No significant decrease in population against national trends, caused by on-site factors
Curlew wintering population	No significant decrease in population against national trends, caused by on-site factors
Redshank wintering population	No significant decrease in population against national trends, caused by on-site factors
Waterfowl assemblage wintering population	No significant decrease in Waterfowl Assemblage population against national trends, caused by on-site factors
Waterfowl assemblage wintering population	Maintain species diversity contributing to the Waterfowl Assemblage
Habitat extent	Maintain or enhance the area of natural and semi-natural habitats potentially usable by Feature bird species. (2056.13 ha intertidal area) subject to natural processes
Habitat extent	Maintain the extent of main habitat components subject to natural processes
Roost sites wintering population	Maintain or enhance sites utilised as roosts

Site Name: Sheep Island SPA	
Location	Latitude 55º 14'56"N Longitude 06º 21'00"W
Area (ha)	3.5
Summary	Sheep Island is located off the north coast of County Antrim in Northern Ireland. It is a small, exposed island with steep cliffs and rocky shores, and holds a breeding colony of Cormorant *Phalacrocorax carbo carbo.*
Qualifying features for which the site is designated:	
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:** Cormorant *Phalacrocorax carbo*, 249 pairs representing at least 0.6% of the breeding Northwestern Europe population (5 year mean 1992-1996)	
Conservation objectives:	
To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:	
Feature	**Component Objective**
Cormorant breeding population	No significant decrease in breeding population against national trends, caused by on-site factors
Cormorant breeding population	Fledging success
Habitat extent	To maintain or enhance the area of natural and semi-natural habitats potentially usable by Feature bird species, subject to natural processes.

Site Name: Rathlin Island SPA	
Location	Latitude 55º 17'30"N Longitude 06º 13'30"W
Area (ha)	3344.62
Summary	Rathlin Island is a large inhabited island located some 4km off the north coast of County Antrim in Northern Ireland. It has basalt and chalk cliffs, some as high as 100m, as well as several sea-stacks on the north and west shores of the island, many of which are important for seabirds. The south and east shores are more gently sloping with areas of maritime grassland and rocky shore. The length of the coastline is approximately 30km. Inland there are wetlands, a limited amount of maritime heath and a mosaic of grazing of varying intensity. The island supports an important breeding assemblage of seabirds, especially including auk and gull species. Large numbers of peregrine *Falco peregrinus* also nest on the cliffs. Although the SPA supports a substantial marine area, the seabirds also feed outside the SPA in surrounding marine areas.

Qualifying features for which the site is designated:

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 1.6% of the breeding population in Ireland (5 year mean, 1992-1996)

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*, 28,064 pairs representing at least 1.2% of the breeding East Atlantic population (Seafarer Count 1985)

Razorbill *Alca torda*, 5,978 pairs representing at least 1.0% of the breeding population

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 66,000 individual seabirds including: puffin *Fratercula arctica*, kittiwake Rissa *tridactyla*, herring gull *Larus argentatus*, lesser black-backed gull *Larus fuscus*, common gull *Larus canus*, fulmar *Fulmarus glacialis*, razorbill *Alca torda*, guillemot *Uria aalge*.

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Component Objective
Peregrine falcon breeding population	No significant decrease in population against national trends, caused by on-site factors
Guillemot breeding population	No significant decrease in population against national trends, caused by on-site factors
Razorbill breeding population	No significant decrease in population against national trends, caused by on-site factors
Fulmar breeding population	No significant decrease in population against national trends, caused by on-site factors
Common gull breeding population	No significant decrease in population against national trends, caused by on-site factors
Lesser black-backed gull breeding population	No significant decrease in population against national trends, caused by on-site factors
Herring gull breeding population	No significant decrease in population against national trends, caused by on-site factors
Kittiwake breeding population	No significant decrease in population against national trends, caused by on-site factors
Puffin breeding population	No significant decrease in population against national trends, caused by on-site factors

Site Name: Rathlin Island SPA	
Seabird assemblage breeding population	No significant decrease in population against national trends, caused by on-site factors
Seabird assemblage breeding population	Maintain species diversity contributing to the breeding seabird assemblage
Habitat	*To maintain or enhance the area of natural and semi-natural habitats potentially usable by Feature bird species subject to natural processes*

Site Name: Antrim Hills SPA	
Location	Latitude 55º 03'45"N Longitude 06º 11'54"W
Area (ha)	27093.12
Summary	The Antrim Hills site comprises two land units. The northern, larger, section extends between Carnanmore and Soarne's Hill, including Ballypatrick Forest, Slieveanorra Forest/Breen Wood and Glenariff/Cleggan Forest, mainly including land above the 220m contour. The southern section comprises the area bounded by Capanagh, Ballyboley and Douglas Top. The site encompasses all lands within these boundaries, excluding wholly-improved pasture, arable land, buildings and associated lands. It includes coniferous plantations, blanket bog, wet and dry heath, grass moor, scrub, inland cliff and limited semi-improved agricultural grassland. The principal interests are the breeding populations of Hen Harrier and Merlin.

Qualifying features for which the site is designated:

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, 25 pairs representing 13.7% of the all-Ireland breeding population (2004 Census)
Merlin Falco columbarius, 8 pairs representing 7.3% of the all-Ireland breeding population (Various years 2000 – 2005)

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Component Objective
Hen harrier breeding population	No significant decrease in population against national trends, caused by on-site factors
Hen harrier breeding population	Fledging success sufficient to maintain or enhance population
Merlin breeding population	No significant decrease in population against national trends, caused by on-site factors
Merlin breeding population	Fledging success sufficient to maintain or enhance population

Site Name: Larne Lough SPA	
Location	Latitude 54º 48'54"N Longitude 05º 44'38"W
Area (ha)	395.94
Summary	Larne Lough is a sea lough on the east coast of Northern Ireland. It is enclosed to the east by the peninsula of Island Magee. Much of the estuary is shallow, having become extensively infilled with sediments of fine muddy sand, and at low water the largest areas of intertidal flats are exposed in the south of the estuary. The northern parts of the estuary are wider and relatively deep, especially at the mouth where dredging is regularly carried out. In the upper reaches of the estuary at Ballycarry, there is an area of saltmarsh. As the effects of salinity and differing tidal inundation are not greatly felt in the upper parts of Larne Lough, the saltmarsh zonation patterns are not distinct. The vegetation is dominated by mid-upper saltmarsh communities and a *Phragmites australis* reedbed, with some saltmarsh pans. The lough is of importance as a breeding and feeding area for a number of tern species as well as being a wintering site for the Canada/Ireland population of light-bellied brent goose *Branta bernicla hrota*. The site also includes the subsumed SPA of Swan Island which was subject to separate classification.

Qualifying features for which the site is designated:

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:
Common tern Sterna hirundo, 180 pairs representing 5.8% of the breeding population in Ireland

Roseate tern Sterna dougallii, 6 pairs representing 1.5% of the breeding population in Ireland (5 year mean, 1993-1997)

Sandwich tern Sterna sandvicensis, 165 individuals representing 3.8% of the breeding population in Ireland

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

Overwinter:
Light-bellied brent goose *Branta bernicla hrota*, 227 individuals representing 1.1% of the wintering Canada/Ireland population (5 year peak mean 1991/2 - 1995/6)

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Component Objective
Sandwich tern breeding population	No significant decrease in breeding population against national trends, caused by on-site factors
Sandwich tern breeding population	Fledging success
Roseate tern breeding population	No significant decrease in breeding population against national trends, caused by on-site factors
Roseate tern breeding population	Fledging success
Common tern breeding population	No significant decrease in breeding population against national trends, caused by on-site factors
Common tern breeding population	Fledging success
Light-bellied brent goose wintering population	No significant decrease in population against national trends, caused by on-site factors
Habitat extent	To maintain or enhance the area of natural and semi-natural habitats potentially usable by Feature bird species (325 ha intertidal area), (breeding areas 1 ha) subject to natural processes
Habitat extent	Maintain the extent of main habitat components subject to natural processes
Roost sites	Maintain or enhance sites utilised as roosts

Site Name: Belfast Lough Open Water SPA	
Location	Latitude 54º 41'00"N Longitude 05º 49'00"W
Area (ha)	5592.99
Summary	Belfast Lough is a large intertidal sea lough situated at the mouth of the River Lagan on the east coast of Northern Ireland. The inner part of the lough comprises a series of mudflats and lagoons and the outer lough is restricted to mainly rocky shores with some small sandy bays. The Belfast Lough Open Water site comprises the marine area below the mean low water mark. The Special Protection Area boundary is entirely coincident with that of Outer Belfast Lough Area of Special Scientific Interest. The site is of importance for supporting a wintering population of great crested grebe.
Qualifying features for which the site is designated:	
Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **Overwinter:** Great crested grebe *Podiceps cristatus*, 1677 individuals representing 0.35% of the wintering Northwestern Europe population (5 year peak mean 1996/7 - 2000/1)	
Conservation objectives:	
To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:	

Feature	Component Objective
Great crested grebe wintering population	No significant decrease in population against national trends, caused by on-site factors
Habitat extent	Maintain the extent of main habitat components subject to natural processes
Roosting/loafing sites	Maintain all locations of sites.

Site Name: Belfast Lough SPA	
Location	Latitude 54º 38'00"N Longitude 05º 54'00"W
Area (ha)	432.14
Summary	Belfast Lough is a large, open sea lough located on the north-eastern coast of Northern Ireland. The inner part of the lough comprises areas of intertidal foreshore, mainly mud-flats and lagoons, and land (subject to past and current land claim) which forms important feeding and roosting sites for significant numbers of wintering waders and wildfowl. The extent of the SPA in the outer lough is restricted to mainly rocky shores with some small sandy bays and beach-head saltmarsh. The site is of importance for a wide range of wintering waterbirds.

Qualifying features for which the site is designated:

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:

Overwinter:
Bar-tailed godwit *Limosa lapponica*, 232 individuals representing 1.3% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6)

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

Overwinter:
Redshank *Tringa totanus*, 2,466 individuals representing 1.6% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/1992 - 1995/1996)

Turnstone *Arenaria interpres*, 734 individuals representing 1.0% of the wintering Western Palearctic - wintering population (5 year peak mean 1991/2 - 1995/6)

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

Over winter, the area regularly supports 20,492 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: goldeneye *Bucephala clangula*, redshank *Tringa totanus*, turnstone *Arenaria interpres*, great crested grebe *Podiceps cristatus*, cormorant *Phalacrocorax carbo*, shelduck *Tadorna tadorna*, mallard *Anas platyrhynchos*, bar-tailed godwit *Limosa lapponica*, eider *Somateria mollissima*, curlew *Numenius arquata*, red-breasted merganser *Mergus serrator*, oystercatcher *Haematopus ostralegus*, ringed plover *Charadrius hiaticula*, lapwing *Vanellus vanellus*, knot *Calidris canutus*, dunlin *Calidris alpina alpina*, black-tailed godwit *Limosa limosa islandica*, scaup *Aythya marila.*

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Component Objective
Redshank wintering population	No significant decrease in population against national trends, caused by on-site factors
Great crested grebe wintering population	No significant decrease in population against national trends, caused by on-site factors
Habitat extent	To maintain or enhance the area of natural and semi-natural habitats potentially usable by Feature bird species (X ha intertidal area, yet to be determined), subject to natural processes
Habitat extent	Maintain the extent of main habitat components subject to natural processes
Roost sites	Maintain or enhance sites utilised as roosts

Site Name: Copeland Islands SPA	
Location	Latitude 54º 41'17"N Longitude 05º 31'03"W
Area (ha)	201.52
Summary	The Copeland Islands site comprises three islands (Copeland Island, referred to as Big Copeland, together with Light House Island and Mew Island), together with associated islets, off the north-east Co. Down coast and close to the entrance to Belfast Lough. The site encompasses the islands down to the low water mark, excluding buildings and associated structures. It includes rocky shores together with limited areas of sand/mud and cobble/boulder beaches. Terrestrial habitats include saltmarsh, freshwater marsh, maritime grassland, limited extent of inland cliff and semi-improved agricultural grassland. The principal interests are the breeding colonies of Manx shearwater and Arctic tern.

Qualifying features for which the site is designated:

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, 566 pairs representing at least 22.6% of the breeding population in Ireland (5 year mean, 1998-2002)

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:
Manx shearwater *Puffinus puffinus*, 4800 pairs representing at least 1.7% of the world population (Total survey 2000-2002)

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Component Objective
Manx shearwater breeding population	No significant decrease in population against national trends, caused by on-site factors
Manx shearwater breeding population	Fledging success
Arctic tern breeding population	No significant decrease in population against national trends, caused by on-site factors
Arctic tern breeding population	Fledging success
Habitat extent	To maintain or enhance the area of natural and semi-natural habitats potentially usable by Feature bird species, (breeding areas 201.20ha) subject to natural processes
Habitat extent	Maintain the extent of main habitat components subject to natural processes

Scotland

Site Name: Treshnish Isles SPA	
Location	Latitude 56º 29'30"N Longitude 06º 25'10"W
Area (ha)	240.6
Summary	The Treshnish Isles are located in the Inner Hebrides of western Scotland. They are a series of small islands and skerries off the west coast of Mull in Argyll. They are rocky, with cliffs, screes and raised beaches, and support strongly maritime grassland and heath. The islands are important for their breeding seabird colonies, especially storm petrel *Hydrobates pelagicus*. The most important seabird colonies are on Lunga, which supports the majority of storm petrels. The Treshnish Isles are also of importance as a traditional wintering locality for Greenland barnacle goose *Branta leucopsis*.
Qualifying features for which the site is designated:	
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:** European storm petrel *Hydrobates pelagicus*, 5,040 pairs representing 5.9% of the GB breeding population (Count, as at 1996) **Over winter:** Barnacle goose *Branta leucopsis*, 82 individuals representing 0.3% of the GB population (Three count mean, 1994, 1995 & 1997)	
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 Colonsay and Western Cliffs SPA	
Location	Latitude 56º 06'44"N Longitude 06º 10'40"W
Area (ha)	3,295.9
Summary	The North Colonsay and Western Cliffs SPA is located on the island of Colonsay in the southern Inner Hebrides off the west coast of Scotland. It comprises the northern promontory of Colonsay and a 2km section of cliffs on the western coast. The hills rise to about 140m above sea level and the cliffs include some almost sheer sections up to about 100m in height. The whole area is craggy, and the mainly acidic rocks support dry and wet heath over the northern hills. On the west coast in particular, there is a strong influence of sea spray, giving a herb-rich sward. Sand dunes, including the 60m high Leac Bhuidhe dune, are found in two areas in the north and are rich in characteristic plant species. The site is of importance for breeding seabirds, including gulls and auks. These feed outside the SPA in surrounding waters as well as further away. Chough *Pyrrhocorax pyrrhocorax* is also a resident species, breeding on cliff areas and foraging widely. They depend on the diverse mix of habitats present within the site and their continued low-intensity agricultural management.

Qualifying features for which the site is designated:

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:
Chough *Pyrrhocorax pyrrhocorax*, 9 pairs representing at least 2.6% of the breeding population in Great Britain (Count, as at 1998)

Over winter:
Chough *Pyrrhocorax pyrrhocorax*, 18 pairs representing at least 2.6% of the wintering population in Great Britain (Count as at 1998)

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 including: kittiwake *Rissa tridactyla* and guillemot *Uria aalge*.

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: Gruinart Flats SPA	
Location	Latitude 55º 50'42"N Longitude 06º 19'33"W
Area (ha)	3261.32
Summary	Gruinart Flats are located on the Hebridean island of Islay on the west coast of Scotland. The SPA comprises a diverse array of coastal habitats typical of western Scotland. The main features are a sheltered estuarine and intertidal sea loch (holding sand- and mud-flats as well as an extensive saltmarsh and sand dunes) surrounded by pastoral farmland and backed by semi-natural upland habitats (including ombrogenous peatlands). The grass fields of the farmland support large wintering goose populations which roost at night on the saltmarsh, whilst the intertidal areas support a diverse assemblage of wintering waterbirds important in a regional context. The entire population of the Greenland race of barnacle goose *Branta leucopsis* arrives at the site in early autumn before dispersing to other wintering areas in Ireland and western Scotland.
Qualifying features for which the site is designated:	
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: **Overwinter:** Barnacle goose *Branta leucopsis*, 20,000 individuals representing at least 74.1% of the wintering population in Great Britain (5 year peak mean 1991/2-1995/6) [favourable maintained] Greenland white-fronted goose *Anser albifrons flavirostris*, 1,000 individuals representing at least 7.1% of the wintering population in Great Britain (Count, as at mid-1990s) [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: Rinns of Islay SPA	
Location	Latitude 55º 46'55"N Longitude 06º 21'00"W
Area (ha)	9,407.46
Summary	The Rinns of Islay SPA is located on the Hebridean island of Islay on the west coast of Scotland. It comprises extensive areas of the western side of the island, being a mosaic of natural and semi-natural habitats including bog, moorland, dune grassland, maritime grassland, marsh and farmland. Much of the natural vegetation is utilised as rough grazing for sheep and cattle and is managed extensively. These habitats are used by an extremely rich assemblage of scarce bird species throughout the year. The site is of particular importance for a number of breeding and wintering birds, including raptors, Greenland white-fronted goose *Anser albifrons flavirostris* and chough *Pyrrhocorax pyrrhocorax*. The choughs depend on the diverse mix of habitats present and their continued low-intensity agricultural management. The site also includes the subsumed SPAs of Glac na Criche and Feur Lochain, which were subject to separate classification.

Qualifying features for which the site is designated:

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:

Chough *Pyrrhocorax pyrrhocorax*, 31 pairs representing at least 9.1% of the breeding population in Great Britain (Count, as at 1998)

Corncrake *Crex crex*, 2 individuals representing at least 0.4% of the breeding population in Great Britain (5 year mean, 1993-1997)

Hen harrier *Circus cyaneus*, 7 pairs representing at least 1.4% of the breeding population in Great Britain (Count, as at 1998)

On passage:

Whooper swan *Cygnus cygnus*, 140 individuals representing at least 2.5% of the population in Great Britain (Count, as at 1988)

Over winter:

Chough *Pyrrhocorax pyrrhocorax*, 62 pairs representing at least 9.0% of the wintering population in Great Britain (Count as at 1998)

Greenland white-fronted goose *Anser albifrons flavirostris*, 1,600 individuals representing at least 11.4% of the wintering population in Great Britain (Count, as at 1993/4)

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,* 10 pairs representing <0.1% of the breeding Western Siberia/Western & Northern Europe/Northwestern Africa population (Count, as at 1997)

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: Bridgend Flats, Islay SPA	
Location	Latitude 55º 46'22"N Longitude 06º 16'05"W
Area (ha)	331.16
Summary	Bridgend Flats are located on the Hebridean island of Islay on the west coast of Scotland. The site lies in a sheltered location at the head of Loch Indaal and comprises natural saltmarsh and intertidal sand and mud-flats. The flats are used as a roosting site for overwintering geese that feed during the day outside the SPA on surrounding areas of farmland as well as in other wetland habitats.
Qualifying features for which the site is designated:	
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: **Overwinter:** Barnacle goose *Branta leucopsis*, 6,700 individuals representing at least 24.8% of the wintering population in Great Britain (No count period specified) [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: Ailsa Craig SPA	
Location	Latitude 55º 15'15"N Longitude 05º 07'00"W
Area (ha)	99.94
Summary	Ailsa Craig is a cone-shaped granitic island, rising to 338 m, situated in the outer part of the Firth of Clyde, western Scotland. Cliffs up to 100m encircle the island and provide nesting sites for a range of seabird species, notably one of the largest colonies of gannet *Morus bassanus* in the world. The seabirds nesting here feed in surrounding waters outside the SPA as well as further afield.

Qualifying features for which the site is designated:

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*, 32,460 pairs representing at least 12.3% of the breeding North Atlantic population (Count, as at 1995) [favourable maintained]

Lesser black-backed gull *Larus fuscus*, 1,800 pairs representing at least 1.5% of the breeding Western Europe/Mediterranean/Western Africa population (Count, as at 1987) [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 65,000 individual seabirds including: guillemot *Uria aalge*, gannet *Morus bassanus*, kittiwake *Rissa tridactyla*, herring gull *Larus argentatus*, lesser black-backed gull *Larus fuscus* [all unfavourable declining, except gannet and guillemot: 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

Republic of Ireland

Site Name: Horn Head to Fanad Head SPA	
Location	Latitude 55º 11'57"N Longitude 08º 01'10"W
Area (ha)	2,386.35
Summary	Horn Head to Fanad Head SPA comprises a number of separate sections of the north County Donegal coastline stretching some 70km eastwards from Dooros Point, southwest of Horn Head to just south of Saldanha Head, south of Fanad Head. The site includes the high coast areas and sea cliffs, the land adjacent to the cliff edge and the sand dunes and lake at Dunfanaghy/Rinclevan. The high water mark forms the seaward boundary, except at Horn Head where the adjacent sea area to a distance of 500m from the cliff base is included. Sea cliffs are present along virtually all the site. Almost all are greater than 10m in height. They are often over 30m and rise impressively to over 200m in a few places. Large areas of habitat included in the site are semi-natural, often on unenclosed land, but there is some improved and semi-improved agricultural land also. Apart from the ubiquitous and well-developed vegetated sea cliff and cliff top habitat, the seminatural habitat present include fixed dunes, Marram (*Ammophila arenaria*) dunes, dune heath, dune slacks, machair, dry heath, wet grassland, improved and semiimproved grassland, and lakes.

Qualifying features for which the site is designated:

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:

Overwinter:
Whooper swan *Cygnus cygnus* 31 individuals
Barnacle goose *Branta leucopsis* 187 individuals
Greenland white-fronted goose *Anser albifrons flavirostris* 231 individuals

Resident:
Peregrine falcon *Falco peregrinus* 7 pairs
Chough *Pyrrhocorax pyrrhocorax* 30 pairs

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

Overwinter:
Teal *Anas crecca* 109 individuals
Mallard *Anas platyrhynchos* 87 individuals
Pochard *Aythya ferina* 234 individuals
Tufted duck *Aythya fuligula* 93 individuals
Coot *Fulica atra* 52 individuals

During the breeding season:
Lapwing *Vanellus vanellus* 10 pairs
Snipe *Gallinago gallinago* 6 pairs
Dunlin *Calidris alpina* 6 pairs
Sandpiper *Actitis hypoleucos* 2 pairs
Fulmar *Fulmarus glacialis* 1974 pairs
Cormorant *Phalacrocorax carbo* 79 pairs
Shag *Phalacrocorax aristotelis* 110 pairs
Herring gull *Larus argentatus* 21 pairs
Kittiwake *Rissa tridactyla* 3853 pairs
Guillemot *Uria aalge* 4387 pairs
Razorbill *Alca torda* 4515 pairs
Puffin *Fratercula arctica* 189 pairs

Conservation objectives:

To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- [breeding] *Fulmarus glacialis*
- [breeding] *Phalacrocorax aristotelis*
- [breeding] *Falco peregrinus*
- [breeding] *Rissa tridactyla*

Site Name: Horn Head to Fanad Head SPA	
• [breeding] *Uria aalge* • [breeding] *Alca torda* • [breeding] *Pyrrhocorax pyrrhocorax* • [wintering] *Anser albifrons flavirostris* • [wintering] *Branta leucopsis*	
Site Name: Lough Swilly SPA	
Location	Latitude 55º 01'00"N Longitude 07º 34'00"W
Area (ha)	8,563.23
Summary	This site, situated in the northern part of County Donegal, comprises the inner part of Lough Swilly, a long inlet of the sea that cuts through a variety of metamorphic rocks on the west side of the Inishowen Peninsula. The Lough Swilly SPA extends from just below Letterkenny north to Rathmullan and, except in the area between Farsetmore and Blanket Nook on the southern side of Lough Swilly, the site is bounded by the High Water Mark; its seaward boundary is the Low Water Mark. Between Farsetmore and Blanket Nook a series of improved pasture and arable fields of importance to geese and swans are included. The site includes sections of the estuaries of the River Swilly, the River Leannan and the Isle Burn and the predominant habitat is a series of extensive sand and mud flats which are exposed at low tide – both estuaries and sand/mud flats are listed on Annex I of the E.U. Habitats Directive. Other habits represented on the site are salt marshes, lakes which are lagoonal in character (at Blanket Nook), rivers and streams, sand and shingle beaches, lowland wet, dry and improved grasslands, arable land, drainage ditches, reedbeds and scrub. The adjacent Inch Lough and Levels are included in a separate SPA.
Qualifying features for which the site is designated:	
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: **Overwinter:** Whooper swan *Cygnus cygnus* 1673 individuals Golden plover *Pluvialis apricaria* 749 individuals Bar-tailed godwit *Limosa lapponica* 139 individuals Greenland white-fronted goose *Anser albifrons flavirostris* 847 individuals Loon *Gavia immer* 19 individuals **During the breeding season:** Sandwich tern *Sterna sandvicensis* 222 pairs Common tern *Sterna hirundo* 89 pairs ***Under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:*** **Overwinter:** Great crested grebe *Podiceps cristatus* 284 individuals Cormorant *Phalacrocorax carbo* 104 individuals Greylag goose *Anser anser* 1218 individuals Brent goose *Branta bernicla* 152 indiviuals Shelduck *Tadorna tadorna* 772 indiviuals Wigeon *Anas penelope* 1580 indiviuals Teal *Anas crecca* 1581 indiviuals Mallard *Anas platyrhynchos* 1169 indiviuals Shoveler *Anas clypeata* 60 indiviuals Tufted duck *Aythya fuligula* 282 indiviuals Scaup *Aythya marila* 103 indiviuals Goldeneye *Bucephala clangula* 170 indiviuals Red-breasted merganser *Mergus serrator* 127 indiviuals Oystercatcher *Haematopus ostralegus* 1595 indiviuals Ringed plover *Charadrius hiaticula* 81 indiviuals Lapwing *Vanellus vanellus* 1408 indiviuals Knot *Calidris canutus* 303 indiviuals Dunlin *Calidris alpina* 7285 indiviuals	

Site Name: Horn Head to Fanad Head SPA

Black-tailed godwit *Limosa limosa* 78 indiviuals
Curlew *Numenius arquata* 1720 indiviuals
Redshank *Tringa totanus* 1404 indiviuals
Greenshank *Tringa nebularia* 48 indiviuals
Turnstone *Arenaria interpres* 73 indiviuals

Conservation objectives:

To maintain the favourable conservation condition of:

- Great crested grebe *(Podiceps cristatus)*
- Grey heron *(Ardea cinerea)*
- Whooper swan *(Cygnus cygnus)*
- Greylag goose *(Anser anser)*
- Shelduck *(Tadorna tadorna)*
- Wigeon *(Anas penelope)*
- Teal *(Anas crecca)*
- Mallard *(Anas platyrhynchos)*
- Shoveler *(Anas clypeata)*
- Scaup *(Aythya marila)*
- Goldeneye *(Bucephala clangula)*
- Red-breasted merganser *(Mergus serrator)*
- Coot *(Fulica atra)*
- Oystercatcher *(Haematopus ostralegus)*
- Knot *(Calidris canutus)*
- Dunlin *(Calidris alpina)*
- Curlew *(Numenius arquata)*
- Redshank *(Tringa totanus)*
- Greenshank *(Tringa nebularia)*
- Black-headed gull *(Larus ridibundus)*
- Common gull *(Larus canus)*
- Sandwich tern *(Sterna sandvicensis)*
- Common tern *(Sterna hirundo)*
- Greenland White-fronted goose *(Anser albifrons flavirostris)*
- Wetlands & Waterbirds - To maintain the favourable conservation condition of the wetland habitat in Lough Swilly SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

Site Name: Greers Isle SPA	
Location	Latitude 55º 12'42"N Longitude 07º 42'50"W
Area (ha)	19.14
Summary	Greers Isle SPA is a very small island in the enclosed and highly sheltered marine waters of Mulroy Bay, County Donegal. The island is approximately 500m from the mainland. The underlying bedrock is probably part of a metadolerite intrusion. The surrounding water to a distance of 200m is included in the site
Qualifying features for which the site is designated:	
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:** Sandwich tern *Sterna sandvicensis* 217 pairs Common tern *Sterna hirundo* 10 pairs Arctic tern *Sterna paradisaea* 17 pairs ***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 gull *Larus canus* 30 pairs Black-headed gull *Larus ridibundus* 200 pairs	
Conservation objectives:	
To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • [breeding] *Larus canus* • [breeding] *Sterna sandvicensis*	

Site Name: Trawbreaga Bay SPA	
Location	Latitude 55º 16'60"N Longitude 07º 16'60"E
Area (ha)	1003.4
Summary	Trawbreaga Bay is a well-sheltered sea bay which lies on the north-western coast of the Inishowen Peninsula, Co. Donegal. An estimated 80% of the bay area empties at low tide to expose a mixture of mudflats, sandbanks and stony/rocky substrates. The intertidal flats provide the main feeding area for the majority of wintering waterfowl. Trawbreaga Bay supports a good diversity of wintering waterfowl though numbers of most species are relatively low. The main importance of the site lies in the barnacle goose population, which is of international importance.

Qualifying features for which the site is designated:

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:

Overwinter:
Barnacle goose *Branta leucopsis* 645 individuals
Whooper swan *Cygnus cygnus* 10 individuals
Bar-tailed godwit *Limosa lapponica* 37 individuals

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

Overwinter:
Brent goose *Branta bernicla* 362 individuals
Wigeon *Anas penelope* 214 individuals
Mallard *Anas platyrhynchos* 161 individuals
Red breasted merganser *Mergus serrator* 11 individuals
Oystercatcher *Haematopus ostralegus* 163 individuals
Ringed plover *Charadrius hiaticula* 89 individuals
Lapwing *Vanellus vanellus* 247 individuals
Dunlin *Calidris alpina* 288 individuals
Curlew *Numenius arquata* 190 individuals
Redshank *Tringa totanus* 34 individuals
Black headed gull *Larus ridibundus* 206 individuals
Common gull *Larus canus* 75 individuals

Conservation objectives:

To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- [wintering] *Branta bernicla hrota*
- [wintering] Chough *Pyrrhocorax pyrrhocorax*
- [wintering] *Branta leucopsis*
- Wetlands & Waterbirds

Site Name: Inishtrahull SPA	
Location	Latitude 55º 26'13"N Longitude 07º 14'20"E
Area (ha)	474.45
Summary	This site is situated approximately 12.5km north-east of Malin Head and comprises the whole of the island of Inishtrahull and a group of islands, the Tor Rocks, which lie approximately 2km north north west of Inishtrahull, and the intervening sea. For most of its length the coastline of Inishtrahull is of cliffs which support important populations of a variety of seabirds during the breeding season. On occasions, the site supports a flock of Barnacle geese. These birds are considered part of the population which nowadays mostly frequents Trawbreaga Bay, however, the island provdes a safe refuge and useful feeding site.
Qualifying features for which the site is designated:	
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: **Overwinter:** Barnacle goose *Branta leucopsis* (77 individuals). ***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:** Fulmar *Fulmarus glacialis* 95 pairs Common gull *Larus canus* 30 pairs Lesser black-backed gull *Larus fuscus* 35 pairs Black-legged kittiwake *Rissa tridactyla* 43 pairs Shag *Phalacrocorax aristotelis* 127 pairs Herring gull *Larus argentatus* 20 pairs	
Conservation objectives:	
To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • [breeding] *Phalacrocorax aristotelis* • [breeding] *Larus canus* • [wintering] *Branta leucopsis*	

Site Name: Lough Foyle SPA	
Location	Latitude 55º 05'0"N Longitude 07º 14'00"E
Area (ha)	587.93
Summary	The site comprises a section of the western shore of Lough Foyle between Muff and White Castle in Co. Donegal. It is almost entirely comprised of intertidal mudflat, but does include small areas of sand and shingle. This site is a relatively small part of the Lough Foyle estuarine complex, which itself is a site of high ornithological importance. The Lough Foyle SPA provides feeding habitat for a range of wintering waterfowl species. Due to its small size the numbers of birds using the site is relatively low.

Qualifying features for which the site is designated:

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

Overwinter:

Great crested grebe *Podiceps cristatus* 21 individuals
Cormorant *Phalacrocorax carbo* 38 individuals
Brent goose *Branta bernicla* 79 individuals
Shelduck 17 *Tadorna tadorna* individuals
Wigeon *Anas penelope* 115 individuals
Mallard *Anas platyrhynchos* 91 individuals
Red-breasted merganser *Mergus serrator* 11 individuals
Oystercatcher *Haematopus ostralegus* 275 individuals
Ringed plover *Charadrius hiaticula* 28 individuals
Knot *Calidris canutus* 47 individuals
Curlew *Numenius arquata 3*90 individuals
Redshank *Tringa totanus* 31 individuals
Greenshank *Tringa nebularia* 9 individuals
Turnstone *Arenaria interpres* 29 individuals
Black-headed gull *Larus ridibundus* 174 individuals
Common gull *Larus canus* 130 individuals

Conservation objectives:

To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- [wintering] *Gavia stellata*
- [wintering] *Podiceps cristatus*
- [wintering] Bewick's swan *Cygnus columbianus*
- [wintering] Whooper swan *Cygnus cygnus*
- [wintering] Greylag goose *Anser anser*
- [wintering] *Branta bernicla hrota*
- [wintering] *Tadorna tadorna*
- [wintering] *Anas penelope*
- [wintering] Teal *Anas crecca*
- [wintering] *Anas platyrhynchos*
- [wintering] Common eider *Somateria mollisima*
- [wintering] *Mergus serrator*
- [wintering] *Haematopus ostralegus*
- [wintering] Golden plover *Pluvialis apricaria*
- [wintering] Northern lapwing *Vanellus vanellus*

C2 Coastal and marine Special Areas of Conservation

Northern Ireland

Site Name: Bann Estuary SAC	
Location	Grid Ref: C797363 (central point) Latitude 55º 10'03"N Longitude 06º 44'57"W
Area (ha)	347.94
Summary	Centred on the mouth of the River Bann, the site is dominated by the major beach and dune system at Portstewart, with smaller dunes at Grangemore and Castlerock, the latter also has a beach. The site is of earth science importance with contemporary coastal processes and associated dune forms, together with features important to understanding post-glacial sea-level history. The dune systems have notable archaeological records. Apart from the dune habitats, the site hosts significant saltmarsh, wet grassland and fen communities, with natural transitions present between many of these – a rare occurrence for Northern Ireland. Notable species of both higher and lower plants occur.

Qualifying features for which the site is designated:

Annex I Habitat
Primary features: Fixed dunes with herbaceous vegetation (`grey dunes`) (priority feature)
Secondary features: Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), embryonic shifting dunes, shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`)

Annex II Species
Primary features: None
Secondary features: None

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Global Status	Component Objective
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	C	To maintain or extend, as appropriate, the area of saltmarsh, subject to natural processes To maintain or enhance, as appropriate, the composition of the saltmarsh communities To maintain transitions between saltmarsh communities and to other adjoining habitats To permit the continued operation of formative and controlling natural processes acting on the saltmarsh communities
Embryonic shifting dunes	C	Maintain or enhance the extent of embryonic shifting dunes subject to natural processes. Allow the natural processes that determine the development and extent of embryonic shifting dunes to operate appropriately.
Fixed dunes with herbaceous vegetation (grey dunes)	B	Maintain and expand the extent of existing species-rich fixed dune, SD8. Maintain and enhance species diversity within the SD8 community including the presence of notable species. Seek nature conservation management over suitable areas immediately outside the SAC where there is possibility of restoring fixed dune. Maintain the diversity and quality of habitats associated with the fixed dunes, e.g. neutral grasslands and scrub, especially where these exhibit a natural transition to fixed dune vegetation.
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	C	Maintain and enhance the extent of white dunes subject to natural processes. Allow the natural processes that determine the development and extent of white dunes to operate appropriately.

Site Name: Bann Estuary SAC	
	Maintain and enhance, as appropriate, the species diversity within this community.

Site Name: North Antrim Coast SAC	
Location	Grid Ref: D022440 (central point) Latitude 55º 13'57"N Longitude 06º 23'36"W
Area (ha)	314.59
-Summary	The North Antrim Coast represents an extensive area of hard cliff along one of the most exposed coastlines in Northern Ireland. The site exhibits contrasting geology. The western part is centred on the Giant's Causeway with its geochemically alkali and intermediate basaltic high cliff, interspersed with a series of coves. The eastern section hosts the limited active and extensive fossil chalk sea-cliffs. The basalt series supports a range of communities including those associated with rock crevices and cliff ledges, and with a range of typical maritime grasslands and heath.

Qualifying features for which the site is designated:

Annex I Habitat
Primary features: Vegetated sea cliffs of the Atlantic and Baltic coasts
Secondary features: Annual vegetation of drift lines, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), fixed dunes with herbaceous vegetation (`grey dunes`) (priority feature), shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`), Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe) (priority feature)

Annex II Species
Primary features: Narrow-mouthed whorl snail *Vertigo angustior*
Secondary features: None

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Global Status	Component Objective
Annual vegetation of drift lines	C	Maintain and enhance the extent of annual vegetation of drift lines subject to natural processes Allow the natural processes which determine the development and extent of annual vegetation of drift lines to operate appropriately Maintain and enhance, as appropriate, the species diversity within this community including the presence of notable species
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	C	To maintain or extend, as appropriate, the area of saltmarsh, subject to natural processes To maintain or enhance, as appropriate, the composition of the saltmarsh communities To maintain transitions between saltmarsh communities and to other adjoining habitats To permit the continued operation of formative and controlling natural processes acting on the saltmarsh communities
Fixed dunes with herbaceous vegetation (grey dunes)	C	Maintain and expand the extent of existing species-rich fixed dune, SD8. Maintain and enhance species diversity within the SD8 community including the presence of notable species. Maintain the diversity and quality of habitats associated with the fixed dunes, e.g. neutral grasslands, scrub, especially where these exhibit natural transition to fixed dune vegetation.
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	C	Maintain and enhance the extent of white dunes subject to natural processes Allow the natural processes which determine the development and extent of white dunes to operate appropriately

Site Name: North Antrim Coast SAC		
		Maintain and enhance, as appropriate, the species diversity within this community
Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)	C	Maintain and expand the extent of existing species-rich dry calcareous grasslands (CG10). Maintain and enhance species diversity within the CG10 community including the presence of notable species. Seek nature conservation management over suitable areas immediately outside the cSAC where there is possibility of restoring calcareous grassland Maintain the diversity and quality of habitats associated with the calcareous grassland, e.g. acid grasslands, wet heath, scrub, especially where these exhibit natural transition to calcareous grassland.
Vegetated sea cliffs of the Atlantic and Baltic coasts	B	Maintain the extent of vegetated sea cliff subject to natural processes Allow the natural processes which determine the development and extent of vegetated sea cliffs to operate appropriately Maintain and enhance, as appropriate, range of maritime rock crevice and cliff ledge communities Maintain and enhance, as appropriate, range of sea-bird cliff communities Maintain and enhance, as appropriate, range of maritime grassland communities Maintain and enhance, as appropriate, range of maritime heath communities Maintain and enhance, as appropriate, range of transitions and other communities No increase in status of non-native species, undesirable invasive species and species not characteristic of typical communities Maintain and enhance, as appropriate, status of rare and notable species Monitor cliff top or near cliff management activities to ensure they do not lead to loss or enrichment of sea cliff associated communities
Vertigo angustior	B	To maintain (and if feasible enhance) population numbers and distribution *. To maintain (and if feasible enhance) the extent and quality (composition and structure) of suitable snail habitat, particularly the fenny grassland

Site Name: Rathlin Island SAC	
Location	Grid Ref: D133518 (central point) Latitude 55º 18'00"N Longitude 06º 13'00"W
Area (ha)	3344.62
Summary	Rathlin Island lies six miles off the north coast of Northern Ireland. It is surrounded by a wide range of rocky habitats and is one of the best examples of reefs in Northern Ireland. Strong tidal streams prevail around most of the island, and there is little silt and turbidity is generally low. Reef habitats include the steep limestone and basalt cliffs on the north wall of the island and areas of boulders on the east and south coasts. A very wide range of species has been recorded around the island, including a high proportion of species of particular interest. Caves are found mainly on the north wall at depth from 0-60+m. Some partially submerged caves are used for breeding by grey seals.

Qualifying features for which the site is designated:

Annex I Habitat
Primary features: Reefs, vegetated sea cliffs of the Atlantic and Baltic coasts, submerged or partially submerged sea caves,
Secondary features: Sandbanks which are slightly covered by sea water all the time, annual vegetation of drift lines

Annex II Species
Primary features: None
Secondary features: None

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Global Status	Component Objective
Reefs	A	Maintain and enhance, as appropriate the extent of the reefs Allow the natural processes which determine the development, structure, function and extent of the reefs, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat.
Submerged or partially submerged sea caves	B	Maintain and enhance, as appropriate the extent of the submerged or partially submerged sea caves Allow the natural processes which determine the development, structure, function and extent of the submerged or partially submerged sea caves, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat.
Vegetated sea cliffs of the Atlantic and Baltic coasts	B	Maintain the extent of vegetated sea cliff subject to natural processes Allow the natural processes which determine the development and extent of vegetated sea cliffs to operate appropriately Maintain and enhance, as appropriate, range of maritime rock crevice and cliff ledge communities Maintain and enhance, as appropriate, range of sea-bird cliff communities Maintain and enhance, as appropriate, range of maritime grassland communities Maintain and enhance, as appropriate, range of maritime heath communities Maintain and enhance, as appropriate, range of transitions and other communities No increase in status of non-native species, undesirable invasive species and species not characteristic of typical communities Maintain and enhance, as appropriate, status of rare and notable species Monitor cliff top or near cliff management activities to ensure they do not lead to loss or enrichment of sea cliff associated communities

Site Name: Rathlin Island SAC		
Annual vegetation of drift lines	C	Maintain and enhance the extent of annual vegetation of drift lines subject to natural processes Allow the natural processes which determine the development and extent of annual vegetation of drift lines to operate appropriately Maintain and enhance, as appropriate, the species diversity within this community including the presence of notable species
Sandbanks which are slightly covered by sea water	C	Allow the natural processes which determine the development, structure and extent of sandbanks which are slightly covered by sea water all the time, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat. Maintain the extent and volume of sandbanks which are slightly covered by sea water all the time, subject to natural processes.

Site Name: Strangford Lough SAC

Location	Latitude 54º 26'40"N Longitude 05º 35'40"E
Area (ha)	15398.54
Summary	The intertidal mudflats and sandflats in the north of Strangford Lough represent the largest single continuous area of such habitat in Northern Ireland. There are very extensive areas of muddy sand from Newtownards to Ardmillan Bay in the west and to Greyabbey in the east. The habitat also occurs in the south-west reaches of the Lough along the northern shore of Lecale. The northern flats support luxuriant beds of the eelgrasses *Zostera noltei* and *Z. angustifolia*. Common eelgrass *Z. marina* and tasselled pondweed *Ruppia maritima* are also present, the latter being widespread but quite local in its distribution. Such extensive beds are rare in the British Isles.

Qualifying features for which the site is designated:

Annex I Habitat

Primary: Mudflats and sandflats not covered by seawater at low tide, coastal lagoons *priority feature, large shallow inlets and bays, reefs

Secondary: Annual vegetation of drift lines, perennial vegetation of stony banks, *Salicornia* and other annuals colonising mud and sand, Atlantic salt meadows (*Glauco-puccinellietalia maritimae*).

Annex II Species

Secondary: Harbour seal *Phoca vitulina*

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Global Status	Component Objective
Large shallow inlet and bay	A	Maintain the extent of the large shallow inlet and bay Allow the natural processes which determine the development, structure, function and extent of the large shallow inlet and bay, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat.
Coastal lagoons	B	Maintain the extent of the coastal lagoons Allow the natural processes which determine the development, structure, function and extent of the coastal lagoons, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat.
Mudflats and sandflats not covered by sea water at low tide	B	Maintain the extent of mudflats and sandflats not covered by sea water at low tide Allow the natural processes which determine the development, structure and extent of mudflats and sandflats not covered by sea water at low tide, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat.
Reefs	B	Maintain the extent of the reefs Allow the natural processes which determine the development, structure, function and extent of the reefs, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat.
Annual vegetation of drift lines	C	Maintain and enhance the extent of annual vegetation of drift lines subject to natural processes Allow the natural processes which determine the development and extent of annual vegetation of drift lines to operate appropriately

Site Name: Strangford Lough SAC		
		Maintain and enhance, as appropriate, the species diversity within this community including the presence of notable species
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	C	To maintain or extend, as appropriate, the area of saltmarsh, subject to natural processes To maintain or enhance, as appropriate, the composition of the saltmarsh communities To maintain transitions between saltmarsh communities and to other adjoining habitats To permit the continued operation of formative and controlling natural processes acting on the saltmarsh communities
Perennial vegetation of stony banks	C	Maintain and enhance the extent of perennial vegetation of stony banks subject to natural processes Allow the natural processes which determine the development and extent of perennial vegetation of stony banks to operate appropriately Maintain and enhance, as appropriate, the species diversity within this community including the presence of notable species
Salicornia and other annuals colonising mud and sand	C	Maintain and enhance the extent of *Salicornia* and other annuals colonising mud and sand subject to natural processes Allow the natural processes which determine the development and extent of *Salicornia* and other annuals colonising mud and sand, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat.
Phoca vitulina	C	Maintain and enhance, as appropriate, the harbour seal population Maintain and enhance, as appropriate, physical features used by harbour seals within the site

Site Name: Murlough SAC	
Location	Latitude 54º 12'40"N Longitude 05º 47'00"E
Area (ha)	11902.03
Summary	Murlough is one of the most diverse and natural dune systems in Northern Ireland. The site is an ancient system with acidic sands and a long history of traditional management. A complex mosaic of different communities, some of which are very species-rich, covers the 'grey dunes'. Marram *Ammophila arenaria* and red fescue *Festuca rubra* are dominant over much of the area, while species such as common restharrow *Ononis repens* and wild thyme *Thymus polytrichus* are prevalent where the sward is shorter and more herb-rich. These grey dunes form part of a well-developed natural succession from 2110 Embryonic shifting dunes and 2120 Shifting dunes along the shoreline on the seaward side, to areas of dune heath and gorse *Ulex europaeus* scrub on the landward side.

Qualifying features for which the site is designated:

Annex I Habitat

Primary: Fixed dunes with herbaceous vegetation (grey dunes)*priority feature, Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)*priority feature

Secondary: Sandbanks which are slightly covered by seawater all the time, mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows (*Glauco-puccinellietalia maritimae*), embryonic shifting dunes, shifting dunes along the shoreline with *Ammophila arenaria*, dunes with *Salix repens spp.argentea* (*Salicion arenariae*).

Annex II Species

Primary: Marsh fritillary butterfly *Euphydryas aurinia*

Secondary: Harbour seal *Phoca vitulina*

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	**Global Status**	**Component Objective**
Atlantic decalcified fixed dunes (Calluno-Ulicetea)	A	Maintain and if feasible, expand the extent of existing decalcified fixed dune, H 11 and H10. Increase permitted into areas of rank dune grassland, NOT into spp-rich short turf (Grey Dune SD8). Maintain and enhance structural and species diversity within the H11 and H10 communities including the presence of notable species. Seek nature conservation management over suitable areas immediately outside the cSAC where there is possibility of restoring decalcified fixed dune – *to be determined* Maintain the diversity and quality of habitats associated with the decalcified fixed dunes, e.g. neutral grasslands, scrub, especially where these exhibit natural transition to decalcified fixed dune vegetation.
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	C	Maintain or extend, as appropriate, the area of saltmarsh, subject to natural processes Maintain or enhance, as appropriate, the composition of the saltmarsh communities Maintain transitions between saltmarsh communities and to other adjoining habitats Permit the continued operation of formative and controlling natural processes acting on the saltmarsh communities
Dunes with *Salix repens ssp. Argentea* (*Salicion arenariae*)	C	Maintain and expand the extent of existing Fixed dunes with *Salix repens.* Increase permitted into areas of rank dune grassland, NOT into spp-rich short turf (Grey Dune SD8). Maintain and enhance species diversity within the SD16 community including the presence of notable species. Seek nature conservation management over suitable areas immediately outside the cSAC where there is possibility of

Site Name: Murlough SAC		
		restoring fixed dune with *Salix repens – to be determined*
Embryonic shifting dunes	C	Maintain or enhance the extent of embryonic shifting dunes subject to natural processes Allow the natural processes which determine the development and extent of embryonic shifting dunes to operate appropriately
Fixed dunes with herbaceous vegetation (grey dunes)	B	Maintain and expand the extent of existing species-rich fixed dune, SD8. Maintain and enhance species diversity within the SD8 community including the presence of notable species. Seek nature conservation management over suitable areas immediately outside the cSAC where there is possibility of restoring fixed dune – *to be determined* Maintain the diversity and quality of habitats associated with the fixed dunes, e.g. neutral grasslands, scrub, especially where these exhibit natural transitions to fixed dune vegetation.
Mudflats and sandflats not covered by seawater at low tide	C	Maintain the extent of mudflats and sandflats not covered by sea water at low tide Allow the natural processes which determine the development, structure and extent of mudflats and sandflats not covered by sea water at low tide, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat.
Sandbanks which are slightly covered by sea water all the time	C	Allow the natural processes which determine the development, structure and extent of sandbanks which are slightly covered by sea water all the time, to operate appropriately Maintain and enhance, as appropriate, the species diversity within this habitat. Maintain the extent and volume of sandbanks which are slightly covered by sea water all the time, subject to natural processes.
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	C	Maintain and enhance the extent of white dunes subject to natural processes Allow the natural processes which determine the development and extent of white dunes to operate appropriately Maintain and enhance, as appropriate, the species diversity within this community
Eurodryas aurinia	B	Maintain (and if feasible enhance) population numbers and distribution. Maintain (and if feasible enhance) the extent and quality of suitable Marsh Fritillary breeding habitat, particularly suitable rosettes of the larval food plant *Succisa pratensis*
Phoca vitulina	C	Maintain (and if feasible enhance) population numbers and distribution of harbour seal. Maintain and enhance, as appropriate, physical features used by harbour seals within the site

Scotland

Site Name: Eileanan agus Sgeiran Lios mór SAC	
Location	Grid Ref: NM888471 (central point) Latitude 56º 34'05"N Longitude 05º 26'15"W
Area (ha)	1139.62
Summary	The island of Lismore on the west coast of Scotland provides the most sheltered and enclosed site for the harbour seal *Phoca vitulina*. Lismore is a composite site comprising five groups of small offshore islands and skerries which are extensively used as haul-out sites by the colony. Seal numbers represent just over 1% of the UK population.
Qualifying features for which the site is designated [condition]:	
Annex I Habitat Primary features: None Secondary features: None **Annex II Species** Primary features: Harbour seal *Phoca vitulina* [favourable maintained] 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 the species	

Site Name: Treshnish Isles SAC	
Location	Grid Ref: NM289429 (central point) Latitude 56º 30'00"N Longitude 06º 24'24"W
Area (ha)	1962.66
Summary	The site includes the Treshnish Isles, a remote chain of uninhabited islands and skerries situated in south-west Scotland. The islands, numerous skerries, islets and reefs support a breeding colony of grey seals *Halichoerus grypus*, contributing just under 3% of annual UK pup production.
Qualifying features for which the site is designated [condition]:	
Annex I Habitat Primary features: None Secondary features: Reefs [favourable maintained] **Annex II Species** Primary features: Grey seal *Halichoerus grypus* [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: Mòine Mhór SAC	
Location	Grid Ref: NR812934 (central point) Latitude 56º 04'50"N Longitude 05º 31'05"W
Area (ha)	1150.41
Summary	The site is located on the west coast of Scotland in Argyll and Bute. The site consists of a waterlogged system of pools and raised bog. The raised bog is very close to sea level and has maritime affinities, grading into saltmarsh. A transition to saltmarsh is an unusual ecological feature of this site. The bog and marsh system supports mosses and grasses.
Qualifying features for which the site is designated [condition]:	
Annex I Habitat Primary features: Active raised bogs (priority feature)[unfavourable recovering], degraded raised bogs still capable of natural regeneration Secondary features: Mudflats and sandflats not covered by seawater at low tide [favourable maintained], Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [favourable recovered], degraded raised bog [unfavourable recovering], old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [unfavourable recovering] **Annex II Species** Primary features: None Secondary features: Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia* [unfavourable declining], otter *Lutra lutra* [favourable maintained]	
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: Tayvallich Juniper and Coast SAC	
Location	Grid Ref: NR712825 (central point) Latitude 55º 58'50"N Longitude 05º 40'05"W
Area (ha)	1213.47
Summary	Tayvallich represents an important and extensive outlier of *Juniperus communis* formations on the west coast of Argyll. This is the only representation in the SAC series of the habitat in western Scotland. The juniper formations occur in an extremely varied habitat mosaic – dry wooded ridges grade into heathland and grassland, with flushes, valley mires and open water transition communities. The juniper is regenerating locally. The site contains a number of marsh fritillary *Euphydryas aurinia* sub-populations which are most likely part of the same metapopulation present at Taynish and Knapdale Woods. Together with the latter site, Tayvallich Juniper and Coast represents the species in the northern part of its UK range. Otter (*Lutra lutra*) are also a qualifying feature of the site.
Qualifying features for which the site is designated:	
Annex I Habitat Primary features: *Juniperus communis* formations on heaths or calcareous grasslands **Annex II Species** Primary features: Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia* Secondary features: otter *Lutra lutra*	
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: South-East Islay Skerries SAC	
Location	Grid Ref: NR446474 (central point) Latitude 55º 39'10"N Longitude 06º 03'40"W
Area (ha)	1498.3
Summary	The site encompasses the skerries, islands and rugged coastline of the Inner Hebridean island of Islay. The site is designated for a nationally-important population of harbour seal *Phoca vitulina*. The south-east coastline areas are extensively used as pupping, moulting and haul-out sites by the seals, which represent between 1.5% and 2% of the UK population.
Qualifying features for which the site is designated [condition]:	
Annex I Habitat Primary features: None Secondary features: None **Annex II Species** Primary features: Harbour seal *Phoca vitulina* [favourable maintained] 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 the species	

Site Name: Solway Firth SAC	
Location	Latitude 54º 58'15"N Longitude 03º 20'12"E
Area (ha)	43636.72
Summary	The Solway is representative of sublittoral sandbanks on the coast of north-west England/south-west Scotland. The sandbanks comprise mainly gravelly and clean sands, owing in part to the very dynamic nature of the estuary. The inner estuary contains constantly changing channels, and a predominance of sand is characteristic of such high-energy systems. There is a transition to less extreme conditions in the outer estuary. The dominant species of the infaunal communities comprise different annelid worms, crustaceans, molluscs and echinoderms, depending on the nature of the substrate.

Qualifying features for which the site is designated:

Annex I Habitat
Primary: Sandbanks which are slightly covered by seawater all the time, estuaries, mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonising mud and sand, Atlantic salt meadows (*Glauco-puccinellietalia maritimae*)
Secondary: Reefs, perennial vegetation of stony banks, fixed dunes with herbaceous vegetation*priority feature

Annex II Species
Primary: Sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*

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

Republic of Ireland

Site Name: Horn Head and Rinclevan SAC	
Location	Latitude 55º 11'36"N Longitude 07º 49'59"E
Area (ha)	2344.32
Summary	Horn Head extends northwards into the Atlantic ocean from Dunfanaghy, County Donegal. This site also extends westwards, reaching just beyond Dooros Point. It is a diverse coastal site containing a wide range of habitats from high rocky quartzite cliffs in the north to mud flats, sand flats, dunes and a brackish lake in the south. In the south-western part of the site is a dune system which is impressive in terms of its size, range of dune types and its relatively undisturbed nature. Of particular note is the area of fixed dunes, a priority habitat listed on Annex I of the EU Habitats Directive. The site also contains Port Lough, a meso/oligotrophic lake of good water quality which has a diverse flora and supports an important population of slender naiad (*Najas flexilis*). This species is listed on Annex II of the EU Habitats Directive.
Qualifying features for which the site is designated:	
Annex I Habitat Fixed dunes with herbaceous vegetation (`grey dunes`) (priority feature), shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`), embryonic shifting dunes, humid dune slacks, machairs **Annex II Species** Whorl snail *Vertigo geyeri,* grey seal *Halichoerus grypus,* petalwort *Petalophyllum ralfsii,* slender naiad *Najas flexilis*	
Conservation objectives:	
To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: • *Vertigo geyeri* • *Halichoerus grypus* • *Petalophyllum ralfsii* • *Najas flexilis* • Embryonic shifting dunes • Shifting dunes along the shoreline with Ammophila arenaria ("white dunes") • Fixed coastal dunes with herbaceous vegetation ("grey dunes") • Dunes with Salix repens ssp.argentea (Salix arenariae) • Humid dune slacks • Machairs (* in Ireland)	

Site Name: Sheephaven SAC	
Location	Latitude 55º 09'27"N Longitude 07º 51'10"E
Area (ha)	1841.97
Summary	Sheephaven Bay is a north-facing bay, situated north of Creeslough on the north-west coast of Co. Donegal. The site occupies the entire inner part of the bay, and includes the intertidal area at Carrickgart. The site receives the flows of a number of rivers, notably the Lackagh River, the Duntally River, the Faymore River and the Carrownamaddy River. The site contains a diversity of habitats ranging from mudflats, salt marshes and sand dunes to lakes, rivers, heath, scrub and woodland.
Qualifying features for which the site is designated:	
Annex I Habitat Mudflats and sandflats not covered by seawater at low tide, old sessile oak woods with *Ilex* and *Blechnum* in the British Isles, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), Mediterranean salt meadows (*Juncetalia maritimi*), shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"), machairs, fixed coastal dunes with herbaceous vegetation ("grey dunes") **Annex II Species** Petalwort *Petalophyllum ralfsii*	
Conservation objectives:	
To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: • Mudflats and sandflats not covered by seawater at low tide • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • *Petalophyllum ralfsii* • Mediterranean salt meadows (*Juncetalia maritimi*) • Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") • Fixed coastal dunes with herbaceous vegetation ("grey dunes") • Machairs (* in Ireland) • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	

Site Name: Tranarossan and Melomore Lough SAC	
Location	Latitude 55º 13'24"N Longitude 07º 48'07"E
Area (ha)	653.63
Summary	The site encompasses the west coast of the Rosguill peninsula from Gladdaghlahan Bay up to Tranarossan Bay, and the whole of the peninsula north of this point (including Rosses Strand and Gortnalughoge Bay). The main habitats are machair, sand dunes, shingle beach, rocky coast, heathland and wetland areas. Machair, a priority habitat on Annex I of the EU Habitats Directive, occurs as extensive, flat to gently undulating plains at both Tranarossan and Melmore.

Qualifying features for which the site is designated:

Annex I Habitat
Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp., mudflats and sandflats not covered by seawater at low tide, decalcified fixed dunes with *Empetrum nigrum*, alpine and boreal heaths, european dry heaths, dunes with *Salix repens* ssp. argentea (*Salicion arenariae*), embryonic shifting dunes, machairs, fixed coastal dunes with herbaceous vegetation ("grey dunes"), shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"), perennial vegetation of stony banks, vegetated sea cliffs of the Atlantic and Baltic coasts

Annex II Species
Petalwort *Petalophyllum ralfsii*

Conservation objectives:

To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

- Mudflats and sandflats not covered by seawater at low tide
- Annual vegetation of drift lines
- Perennial vegetation of stony banks
- Vegetated sea cliffs of the Atlantic and Baltic coasts
- *Petalophyllum ralfsii*
- Embryonic shifting dunes
- Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")
- Fixed coastal dunes with herbaceous vegetation ("grey dunes")
- Decalcified fixed dunes with Empetrum nigrum
- Dunes with Salix repens ssp.argentea (Salix arenariae)
- Machairs (* in Ireland)
- Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
- European dry heaths
- Alpine and Boreal heaths

Site Name: Mulroy Bay SAC	
Location	Latitude 55º 10'43"N Longitude 07º 43'58"E
Area (ha)	3209.13
Summary	Mulroy Bay is an extremely sheltered, narrow inlet situated on the north coast of Co. Donegal. Mulroy Bay displays excellent examples of two habitats listed on Annex I of the EU Habitats Directive – reefs and large shallow inlets and bays. The site contains a good range of different sediment types which includes coarse sand, the free-living red alcareous algae called maerl (also known as 'coral') and a variety of exposed and sheltered reefs with strong to weak currents. Extremely sheltered reefs subject to weak currents, as found in Mulroy Bay, are rare in Ireland. The Bay also supports significant numbers of wintering birds and a population of otter, listed on Annex II of the EU Habitats Directive.
Qualifying features for which the site is designated:	
Annex I Habitat Large shallow inlets and bays, reefs **Annex II Species** Otter *Lutra lutra*	
Conservation objectives:	
To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: • Large shallow inlets and bays • Reefs • *Lutra lutra*	

Site Name: North Inishowen Coast SAC	
Location	Latitude 55º 17'41"N Longitude 07º 17'37"E
Area (ha)	7069.09
Summary	The North Inishowen Coast, covering the most northerly part of the island of Ireland, stretches from Crummies Bay in the west up to Malin Head and back down to Inishowen Head to the east. It encompasses an excellent variety of coastal habitats including high rocky cliffs, offshore islands, sand dunes, salt marsh, a large intertidal bay, and rocky, shingle and sand beaches. Sea cliffs and their associated flora is a feature of the site. Otter is regularly seen along the shoreline and may breed within the site and is listed on Annex II of the EU Habitats Directive.
Qualifying features for which the site is designated:	
Annex I Habitat Primary features: Vegetated sea cliffs of the Atlantic and Baltic coasts Secondary features: Annual vegetation of drift lines, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), fixed dunes with herbaceous vegetation (`grey dunes`) (priority feature)**,** shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`), species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe) (priority feature) **Annex II Species** Narrow-mouthed whorl snail *Vertigo angustior* , otter *Lutra lutra*	
Conservation objectives:	
To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: • *Vertigo angustior* • Mudflats and sandflats not covered by seawater at low tide • Perennial vegetation of stony banks • Vegetated sea cliffs of the Atlantic and Baltic coasts • *Lutra lutra* • Fixed coastal dunes with herbaceous vegetation ("grey dunes") • Machairs • European dry heath	

Site Name: Inishtrahull SAC	
Location	Latitude 55º 26'12"N Longitude 07º 14'20"E
Area (ha)	471.22
Summary	This site is situated approximately 12.5km north-east of Malin Head and comprises the whole of the island of Inishtrahull and a group of islands, the Tor Rocks, which lie approximately 2km north-north-west of Inishtrahull, and the intervening sea. The Tor Rocks, the most northerly point of land in Ireland, comprise six rocky pinnacles rising to approximately 20 m above the High Water Mark, with about eight sub-tidal rocks clustered about them. The island of Inishtrahull (34ha) rises to 43m at its western end and extends west-east for some 1.5km. The geology of the site is of Lewisian gneiss, considered to be the oldest rock in Ireland, and having affinities with the rocks of southern Greenland and some of the Hebridean Islands. The site is important as it has the most northerly example of vegetated sea cliffs in Ireland. While not particularly high or sheer, these are extremely exposed.
Qualifying features for which the site is designated:	
Annex I Habitat Vegetated sea cliffs of the Atlantic and Baltic coasts **Annex II Species** None	
Conservation objectives:	
To maintain or restore the favourable conservation condition of the Annex I habitat for which the SAC has been selected: • Vegetated sea cliffs of the Atlantic and Baltic coasts	

Site Name: Lough Swilly SAC	
Location	Latitude 55º 03'01"N Longitude 07º 32'03"E
Area (ha)	9261.64
Summary	The SAC is a large site, situated in the northern part of Co. Donegal, comprises the inner part of Lough Swilly. It extends from below Letterkenny to just north of Buncrana. Lough Swilly is a long sea-lough, cutting through a variety of metamorphic rocks on the west side of Inishowen. The site is estuarine in character, with shallow water and intertidal sand and mud flats being the dominant habitats. Salt marshes are well represented in the inner sheltered areas of the site. Lough Swilly is an important site for waterfowl in autumn and winter. The shallow waters provide suitable habitat for grebes and diving duck, while the intertidal flats are used by an excellent diversity of wildfowl and waders. The site supports a population of otter, a species listed on Annex II of the EU Habitats Directive.
Qualifying features for which the site is designated:	
Annex I Habitat Estuaries, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), old sessile oak woods with *Ilex* and *Blechnum* in the British Isles, *Spartina* swards (*Spartinion maritimae*), coastal lagoons **Annex II Species** Otter *Lutra lutra*	
Conservation objectives:	
To maintain the favourable conservation condition of Estuaries in Lough Swilly SAC To restore the favourable conservation condition of Lagoons in Lough Swilly SAC To restore the favourable conservation condition of Atlantic salt meadows in Lough Swilly SAC To restore the favourable conservation condition of Otter in Lough Swilly SAC To restore the favourable conservation condition of Old oak woodland with *Ilex* and *Blechnum* in Lough Swilly SAC	

C3 Riverine Special Areas of Conservation

Northern Ireland

Site Name: River Faughan and Tributaries SCI	
Location	Grid Ref: C513087 (central point) Latitude 54º55'25"N Longitude 07º11'57"W
Area (ha)	293.27
Summary	The River Faughan and Tributaries includes the River Faughan and its tributaries the Burntollet River, Bonds Glen and the Glenrandal River (and its tributary the Inver River). It is estimated that the number of returning salmon entering the river system is on average around 3,500, which is approximately 6% of the Northern Ireland spawning population, making the River Faughan and Tributaries one of the most important salmon rivers in the British Isles. The River Faughan and its tributaries are among the most productive rivers with the main run of fish occurs during the summer months and significant numbers also entering in the autumn. The River Faughan also has a considerable run of migratory sea trout. The abundance of fish also attracts larger predators such as otter. Evidence of otter activity, in the form of spraints, is found along the length of the River Faughan and its main tributaries. The main woodland blocks are predominantly oakwood which is acidic in nature. It can have a mixed canopy comprised of Sessile oak, downy birch, hazel, ash, alder and willows, in addition to introduced species such as beech and sycamore.

Qualifying features for which the site is designated

Annex I Habitat
Primary features: None
Secondary features: Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

Annex II Species
Primary features: Atlantic salmon *Salmo salar*
Secondary features: Otter *Lutra lutra*

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Objective
Atlantic salmon *Salmo salar*	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population. Maintain and if possible enhance the extent and quality of suitable Salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate.
Otter *Lutra lutra*	Maintain and if possible increase population numbers and distribution. Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats
Upland oak woodlands	Maintain and where feasible expand the extent of existing oak woodland but not at the expense of other features. (There are areas of degraded heath, wetland and damp grassland which have the potential to develop into oak woodland) Maintain and enhance oak woodland species diversity and structural diversity. Maintain the diversity and quality of habitats associated with the oak woodland, e.g. fen, swamp, grasslands, scrub, especially where these exhibit natural transition to oak woodland Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation. Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.

Site Name: River Foyle and tributaries SAC	
Location	Grid Ref: H353876 (central point) Latitude 54º44'10"N Longitude 07º27'06"W
Area (ha)	770.12
Summary	The River Foyle and Tributaries is a large, cross-border river in the north-west of Britain and Ireland. The river is notable for the physical diversity and naturalness of the banks and channels, especially in the upper reaches, and the richness and naturalness of its plant and animal communities. The river has the largest population of Atlantic salmon *Salmo salar* in Northern Ireland, with around 15% of the estimated spawning numbers.

Qualifying features for which the site is designated

Annex I Habitat
Primary features: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
Secondary features: None

Annex II Species
Primary features: Atlantic salmon *Salmo salar*
Secondary features: Otter *Lutra lutra*

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Grade	Objective
Atlantic salmon *Salmo salar*	B	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population. Maintain and if possible enhance the extent and quality of suitable salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate.
Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	B	Maintain and if possible enhance extent and composition of community. Improve water quality Improve channel substrate quality by reducing siltation. Maintain and if feasible enhance the river morphology
Otter *Lutra lutra*	C	Maintain and if possible increase population numbers and distribution. Maintain the extent and quality of suitable otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats

Site Name: Owenkillew River SAC	
Location	Grid Ref: H559870 (central point) Latitude 54º43'40"N Longitude 07º07'56"W
Area (ha)	770.12
Summary	The Owenkillew River rises in the Sperrin Mountains in Northern Ireland and flows westwards, forming part of the Lough Foyle system. It is a large river, being ultra-oligotrophic in its upland reaches, and then gradually becoming oligotrophic and oligo-mesotrophic through its middle and lower reaches. The Owenkillew River is notable for the physical diversity and naturalness of the bank and channel, and the richness and naturalness of its plant and animal communities. Beds of stream water-crowfoot *Ranunculus penicillatus* ssp. *penicillatus* occur throughout its middle and lower reaches, typically in association with intermediate water-starwort *Callitriche hamulata*. The freshwater pearl mussel *Margaritifera margaritifera* population, which is estimated to have a minimum number of 10,000 individuals, is confined to 4km of undisturbed river channel in its upper reaches. It is the largest known population surviving in Northern Ireland. The Owenkillew River is associated with several woodlands which in combination represent one of the best examples of old sessile oak wood in Northern Ireland. The woods contain a number of associated physical features, including waterfalls, gorges, cliffs and scattered boulder scree, which contribute to the diversity of the woodland communities.

Qualifying features for which the site is designated

Annex I Habitat
Primary features: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
Secondary features: Bog woodland

Annex II Species
Primary features: Freshwater pearl mussel *Margaritifera margaritifera*
Secondary features: Atlantic salmon *Salmo salar*, otter *Lutra lutra*

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Grade	Objective
Freshwater pearl mussel *Margaritifera margartifera*	B	Maintain and if feasible enhance population numbers through natural recruitment. Improve age structure of population. Improve water quality. Improve channel substrate quality by reducing siltation. Ensure host fish population is adequate for recruitment. Increase the amount of shading through marginal tree cover along those sections of river currently supporting this species.
Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitricho-Batrachion* vegetation	B	Maintain and if feasible enhance extent and composition of community. Improve water quality Improve channel substrate quality by reducing siltation. Maintain and if feasible enhance the river morphology
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	B	Maintain and expand the extent of existing oak woodland. (There is an area of degraded bog, wetland and damp grassland which have the potential to develop into oak woodland Maintain and enhance Oak woodland species diversity and structural diversity. Maintain the diversity and quality of habitats associated with the Oak woodland, e.g. fen, swamp, grasslands, scrub, especially where these exhibit natural transition to Oak woodland Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.

Site Name: Owenkillew River SAC		
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.
Bog woodland	C	Maintain and expand the extent of existing bog woodland. (There is an area of degraded bog, wetland and damp grassland that have the potential to develop into bog woodland. Maintain and enhance bog woodland species diversity and structural diversity. Maintain the diversity and quality of habitats associated with the bog woodland, e.g. fen, swamp, especially where these exhibit natural transition to swamp woodland. Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation. Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.
Otter *Lutra lutra*	C	Population numbers and distribution to be maintained and if possible, expanded. Maintain the extent and quality of suitable otter habitat, in particular the chemical and biological quality of the water, and all associated wetland habitats
Salmon *Salmo salar*	C	Maintain and if possible, expand existing population numbers and distribution Maintain and where possible, enhance the extent and quality of suitable salmon habitat, in particular the chemical and biological quality of the water

Site Name: River Roe and tributaries SAC

Location	Grid Ref: C687159 (central point) Latitude 54º59'41"N Longitude 06º55'44"W
Area (ha)	407.6
Summary	The River Roe and Tributaries SCI site is located in Northern Ireland. The area is notable for the physical diversity and naturalness of the banks and channels, especially in the upper reaches, and the richness and naturalness of its plant and animal communities, in particular the population of Atlantic salmon, which is of international importance and in the extent of upland oakwood present.

Qualifying features for which the site is designated

Annex I Habitat
Primary features: None
Secondary features: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

Annex II Species
Primary features: Atlantic salmon *Salmo salar*
Secondary features: Otter *Lutra lutra*

Conservation objectives:

To maintain each feature in favourable condition. For each feature there are a number of component objectives which are outlined below:

Feature	Grade	Objective
Atlantic salmon *Salmo salar*	B	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population. Maintain and if possible enhance the extent and quality of suitable salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate.
Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitricho-Batrachion* vegetation	C	Maintain and if possible enhance extent and composition of community. Improve water quality Improve channel substrate quality by reducing siltation. Maintain and if feasible enhance the river morphology
Old Sessile Oak Woodlands with *Ilex* and *Blechnum* in the British Isles	C	Maintain and where feasible expand the extent of existing oak woodland but not at the expense of other SAC (ABC) features. (There are areas of degraded heath, wetland and damp grassland which have the potential to develop into oak woodland) Maintain and enhance oak woodland species diversity and structural diversity. Maintain the diversity and quality of habitats associated with the oak woodland, e.g. fen, swamp, grasslands, scrub, especially where these exhibit natural transition to oak woodland Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation. Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.
Otter *Lutra lutra*	C	Maintain and if possible increase population numbers and distribution. Maintain the extent and quality of suitable otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats

Scotland

Site Name: River Bladnoch SAC	
Location	Grid Ref: NX347604 (central point) Latitude 54º54'30"N Longitude 04º35'00"W
Area (ha)	300.02
Summary	The River Bladnoch supports a high-quality salmon population in south-west Scotland, which unusually for rivers in this area still supports a spring run of salmon. The river drains a moderate-sized catchment with both upland and lowland areas, and this variety is reflected in the river's ecological and water quality characteristics. Whilst there are problems in the river's headwaters arising from acidification, national and local initiatives are both reducing and ameliorating the worst effects of this pollution source.
Qualifying features for which the site is designated	
Annex I Habitat Primary features: None Secondary features: None **Annex II Species** Primary features: Atlantic salmon *Salmo salar* 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 the species	

Site Name: Endrick Water SAC	
Location	Grid Ref: NS506873 (central point) Latitude 56º03'20"N Longitude 04º24'00"W
Area (ha)	239.11
Summary	The Endrick Water has been designated as a Special Area of Conservation (SAC) because of its important populations of Atlantic salmon, river lamprey and brook lamprey. The Endrick Water is the largest river flowing into Loch Lomond and is the main spawning ground for salmon in the loch catchment. The river lamprey population is the only one in Great Britain that lives its adult stage in freshwater (Loch Lomond) rather than the sea. The SAC covers most of the main stem of the river, from the Loup of Fintry waterfall downstream to Loch Lomond. The main land use in the catchment is farming, with sheep rearing in the upper reaches and mixed farming lower down. Other land uses along the Endrick include forestry and areas for public recreation.

Qualifying features for which the site is designated

Annex I Habitat
Primary features: None
Secondary features: None

Annex II Species
Primary features: Brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*
Secondary features: Atlantic salmon *Salmo salar*

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 the species

England

Site Name: River Eden SAC	
Location	Grid Ref: NY462237 (central point) Latitude 54º36'19"N Longitude 02º49'58"W
Area (ha)	2,463.23
Summary	The Eden is an outstanding floristically rich, northern river on sandstone and hard limestone. The diversity of aquatic plants is amongst the highest of all rivers in Britain. The aquatic flora includes uncommon species and those at the geographical limit of their British distribution. Some of the headwaters of the Eden comprise one of the most important British sites for the native white-clawed crayfish. The river is also of high invertebrate interest for species associated with river shingles and sandbanks. The fish fauna includes Atlantic salmon, bullhead and all three species of lamprey found in British rivers.

Qualifying features for which the site is designated

Annex I Habitat
Primary features: Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*, water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) * Priority feature
Secondary features: None

Annex II Species
Primary features: White-clawed (or Atlantic stream) crayfish *Austropotamobius pallipes*, sea lamprey *Petromyzon marinus*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, Atlantic salmon *Salmo salar*, bullhead *Cottus gobio*, otter *Lutra lutra*
Secondary features: None

Conservation objectives:

To maintain*, in favourable condition, the river as a habitat for:

- *Ranunculus* communities
- Populations of Atlantic salmon and bullhead
- Populations of sea, river and brook lamprey
- Populations of white-clawed crayfish

And the river and adjoining land as habitat for:

- Populations of otter

And to maintain* the following features in favourable condition:

- Residual alluvial woodland
- Oligotrophic to mesotrophic standing waters of plains to sub-alpine levels.

* Maintenance implies restoration if the feature is not already in favourable condition.

Site Name: River Derwent and Bassenthwaite Lake SAC	
Location	Grid Ref: NY262207 (central point) Latitude 54º34'35"N Longitude 03º08'32"W
Area (ha)	1,832.96
Summary	The Derwent-Cocker is the largest oligotrophic, or nutrient poor, river in England that still retains high water quality and a natural channel. This low nutrient status is reflected in the abundance of bryophytes and the absence of a number of other plant species found in more nutrient rich rivers. There is, however, a natural succession of plant communities from source to mouth reflecting a slight increase in nutrient status downstream. Both rivers flow through two lakes, Derwentwater and Bassenthwaite on the Derwent and Buttermere and Crummock Water on the Cocker. These lakes have a hydrological buffering effect which helps stabilise the flow regimes. The nationally rare plant floating water plantain occurs in Derwentwater. In places around Derwentwater a transition from open water to wet woodland, fen and swamp is present. The fish fauna of the Rivers Derwent and Cocker include salmon and sea, brook, and river lampreys. Derwentwater has populations of the nationally rare fish vendace. Apart from Derwentwater, in Britain vendace is only known from Bassenthwaite Lake in the same catchment. Crummock Water has Arctic charr, a nationally scarce member of the trout family found in oligotrophic lakes. The Derwent catchment supports otters.

Qualifying features for which the site is designated

Annex I Habitat
Primary features: Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*
Secondary features: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

Annex II Species
Primary features: Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia,* sea lamprey *Petromyzon marinus*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, Atlantic salmon *Salmo salar*, otter *Lutra lutra*, floating water-plantain *Luronium natans*
Secondary features: None

Conservation objectives:

The Conservation Objectives for this site are, subject to natural change, to maintain the following habitats and geological features in favourable condition (*), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated (SSSI, SAC, SPA, Ramsar).

Habitat Types represented (Biodiversity Action Plan categories)
Rivers and Streams
Standing Open Water (oligotrophic to mesotrophic)
Fen, marsh and swamp
Wet woodland

Species represented

- Floating water plantain *Luronium natans*
- Vascular plant assemblage
- Atlantic salmon *Salmo salar*
- River lamprey *Lampetra fluviatilis*
- Brook lamprey *Lampetra planeri*
- Sea lamprey *Petromyzon marinus*
- Vendace *Coregonus albula*
- Arctic charr *Salvelinus alpinus*
- Otter *Lutra lutra*
- Invertebrate assemblage of fast flowing water
- Invertebrate assemblage of mineral marsh and open water
- Invertebrate assemblage of litter-rich fluctuating wetlands

(*) or restored to favourable condition if features are judged to be unfavourable.

Site Name: River Ehen SAC	
Location	Grid Ref: NY031144 (central point) Latitude 54º30'55"N Longitude 03º29'51"W
Area (ha)	24.39
Summary	The River Ehen is on the western fringe of the Lake District. It forms the outfall from Ennerdale Water and flows some 20km before reaching the Irish Sea at Sellafield. For much of its upper length the River Ehen is classed as an oligotrophic, or nutrient-poor, river flowing over bryophyte-dominated substrates of shingle, pebbles and rock. Between Ennerdale Water and the confluence with the River Keekle at Cleator Moor the Ehen meanders across a narrow floodplain with extensive areas of riparian woodland and trees. This stretch of the river supports outstanding populations of the freshwater mussel *Margaritifera margaritifera*. Collectively, this is the largest known population of this species in England and the only one showing recent recruitment.

Qualifying features for which the site is designated

Annex I Habitat
Primary features: None
Secondary features: None

Annex II Species
Primary features: Freshwater pearl mussel *Margaritifera margaritifera*
Secondary features: Atlantic salmon *Salmo salar*

Conservation objectives:

The Conservation Objectives for this site are, subject to natural change, to maintain the following habitats and geological features in favourable condition (*), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated (SSSI, SAC, SPA, Ramsar).

Habitat types represented (Biodiversity Action Plan categories)
Rivers and streams (supporting fresh water pearl mussel)

Species represented
Freshwater pearl mussel *Margaritifera margaritifera*
Atlantic salmon *Salmo salar*

(*) or restored to favourable condition if features are judged to be unfavourable.

Republic of Ireland

Site Name: River Finn SAC	
Location	Latitude 54º48'00"N Longitude 07º46'00"W
Area (ha)	5,501.79
Summary	This site comprises almost the entire freshwater element of the Finn and its tributaries – the Corlacky, the Reelan sub-catchment, the Sruhamboy, Elatagh, Cummirk and Glashagh, and also includes Lough Finn, where the river rises. The spawning grounds at the headwaters of the Mourne and Derg Rivers, Loughs Derg and Belshade and the tidal stretch of the Foyle north of Lifford to the border are also part of the site. The Finn and Reelan, rising in the Bluestack Mountains, drain a catchment area of 195 square miles. All of the site is in Co. Donegal. The site is a SAC selected for active blanket bog, a priority habitat listed under Annex I of the E.U. Habitats Directive. The site is also listed for lowland oligotrophic lakes, wet heath and transition mires, also on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Atlantic salmon and Otter.

Qualifying features for which the site is designated

Annex I Habitats

Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*), northern Atlantic wet heaths with *Erica tetralix,* blanket bogs (* if active only), transition mires and quaking bogs

Annex II Species

Atlantic salmon *Salmo salar* (only in fresh water), otter *Lutra lutra*

Conservation objectives:

To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

- *Salmo salar* (only in fresh water)
- *Lutra lutra*
- Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- Northern Atlantic wet heaths with *Erica tetralix*
- Blanket bogs (* if active only)
- Transition mires and quaking bogs

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