

SECTION 3: BIOLOGICAL ENVIRONMENT



CHAPTER 10: NATURE CONSERVATION

10. NATURE CONSERVATION

This chapter considers the full range of designated sites that could be affected by the Aberdeen Harbour Expansion Project. It provides a summary of each site, a brief description of the area, and identifies qualifying features where there is a potential for connectivity between the feature and the proposed development. Sites have been tabulated within each section and cross-referenced to the relevant impact assessment within this ES, where a full assessment of the potential impacts upon the interest features for a particular site is presented. Where necessary, references to technical appendices are also provided. The other chapters within the ES of relevance are:

- Chapter 6: Marine Physical Environment;
- Chapter 12: Benthic Ecology;
- Chapter 13: Fish and Shellfish Ecology;
- Chapter 14: Marine Ornithology;
- Chapter 15: Marine Mammals; and
- Volume 4: Habitats Regulations Appraisal (HRA).

10.1 Marine Nature Conservation Designations Introduction

Designated sites of marine nature conservation interest identified and outlined in this chapter include the following (relevant coastal sites illustrated in Figure 10.1, Figure 10.2, Figure 10.3 and Figure 10.4):

- Special Areas of Conservation (SACs) (with draft SACs noted);
- Special Protection Areas (SPAs) (with draft SPAs noted);
- Ramsar sites;
- Sites of Special Scientific Interest (SSSI);
- Nature Conservation Marine Protected Areas (NCMPAs);
- National Nature Reserves (NNRs);
- Local Nature Reserves (LNRs); and
- Local Nature Conservation Sites (LNCS).

Not all designated sites have been included in this chapter as effect-pathways to receptors were not identified for some. For example, the Cove SSSI to the south of Nigg Bay has two notified features: Maritime cliff (Supralittoral rock (Coast)) and Dickie's bladder-fern (*Cystopteris dickieana*) (Vascular plants). Neither feature could be affected by the development and therefore the site has not been considered in the chapter.

SACS, SPAs and NCMPAs which also qualify as UK OSPAR Marine Protected Area (MPA) sites are indicated in the relevant tables provided in Section 10.4, Baseline.

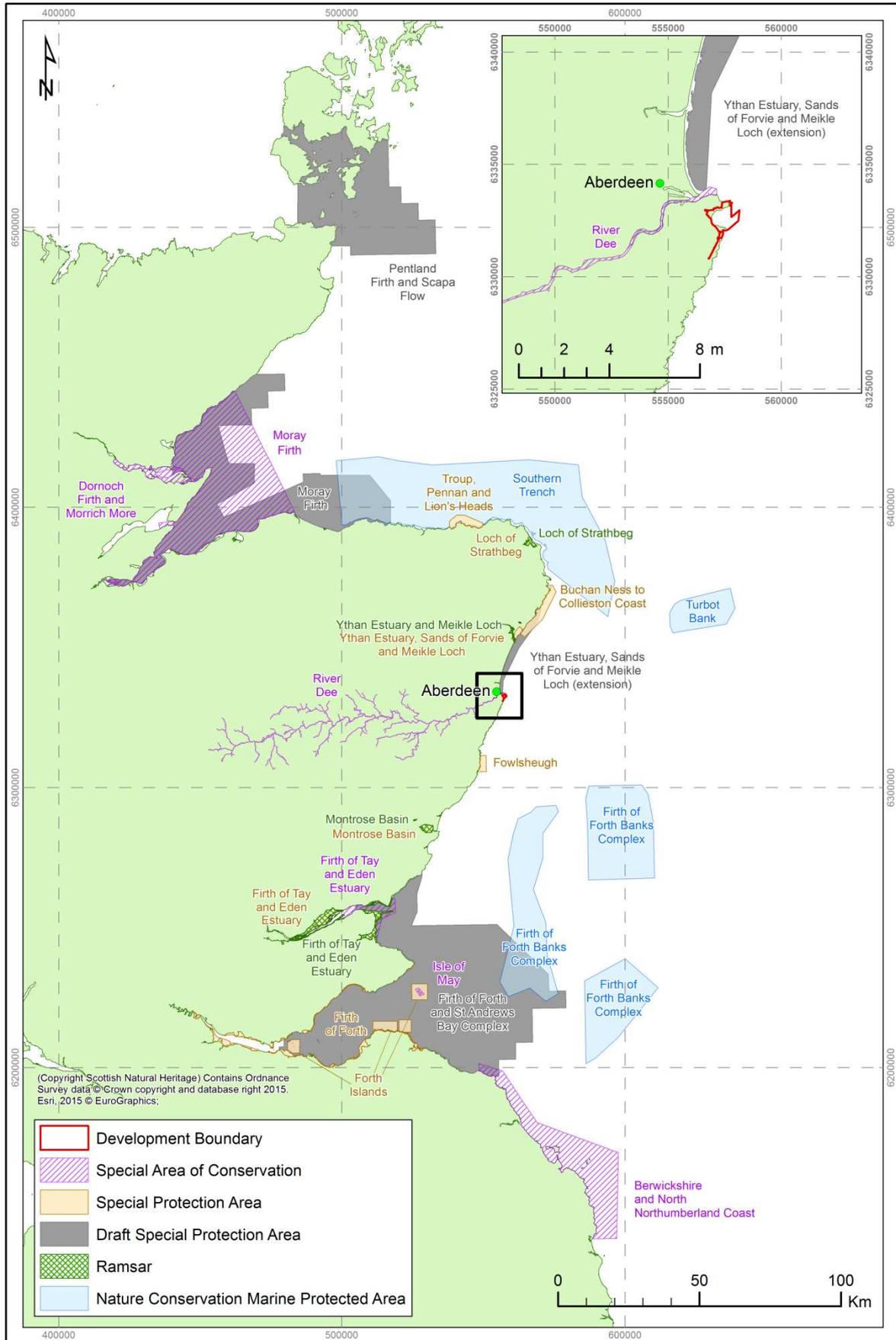


Figure 10.1: SAC, SPA, dSPA, Ramsar and NCMPA site designations

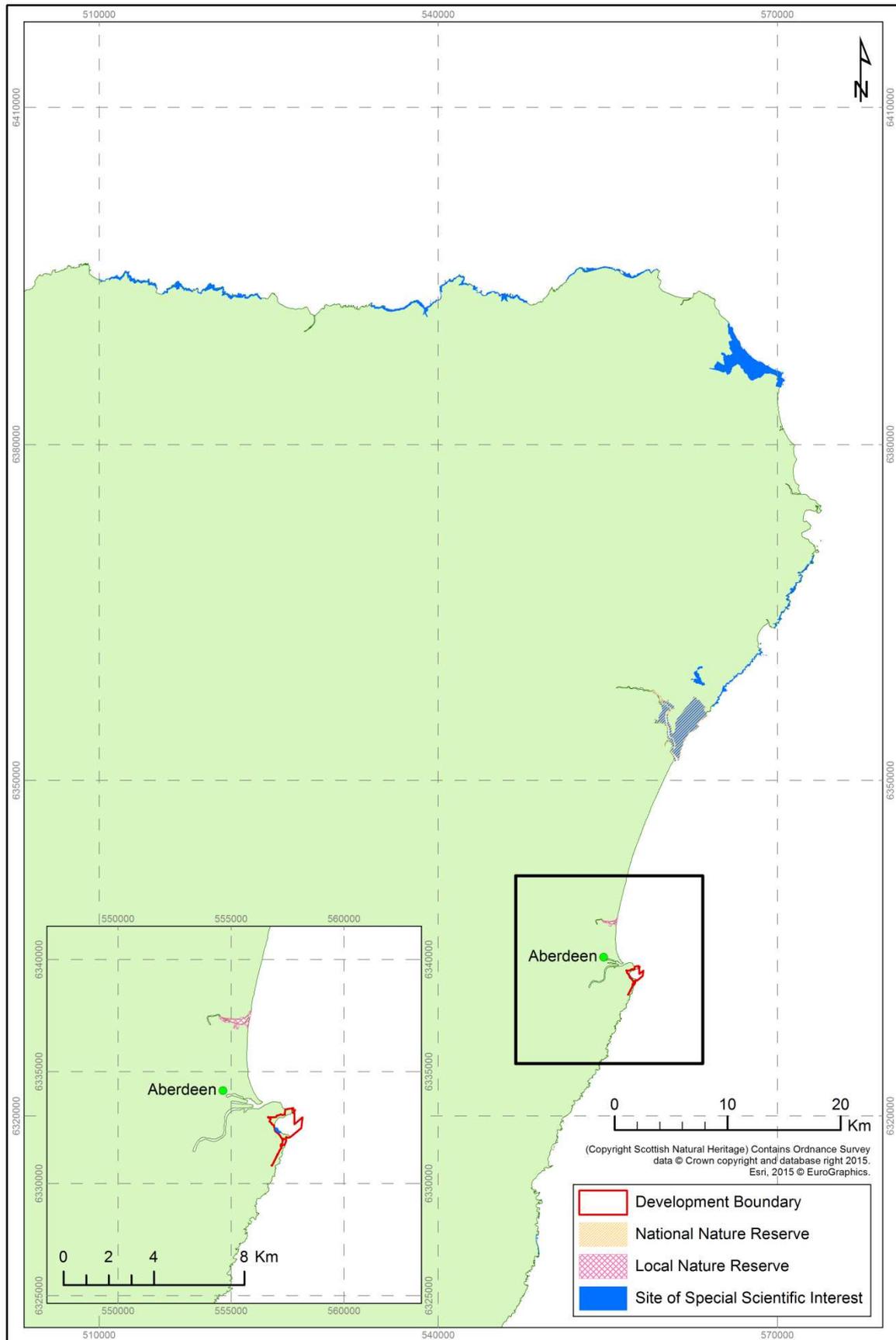
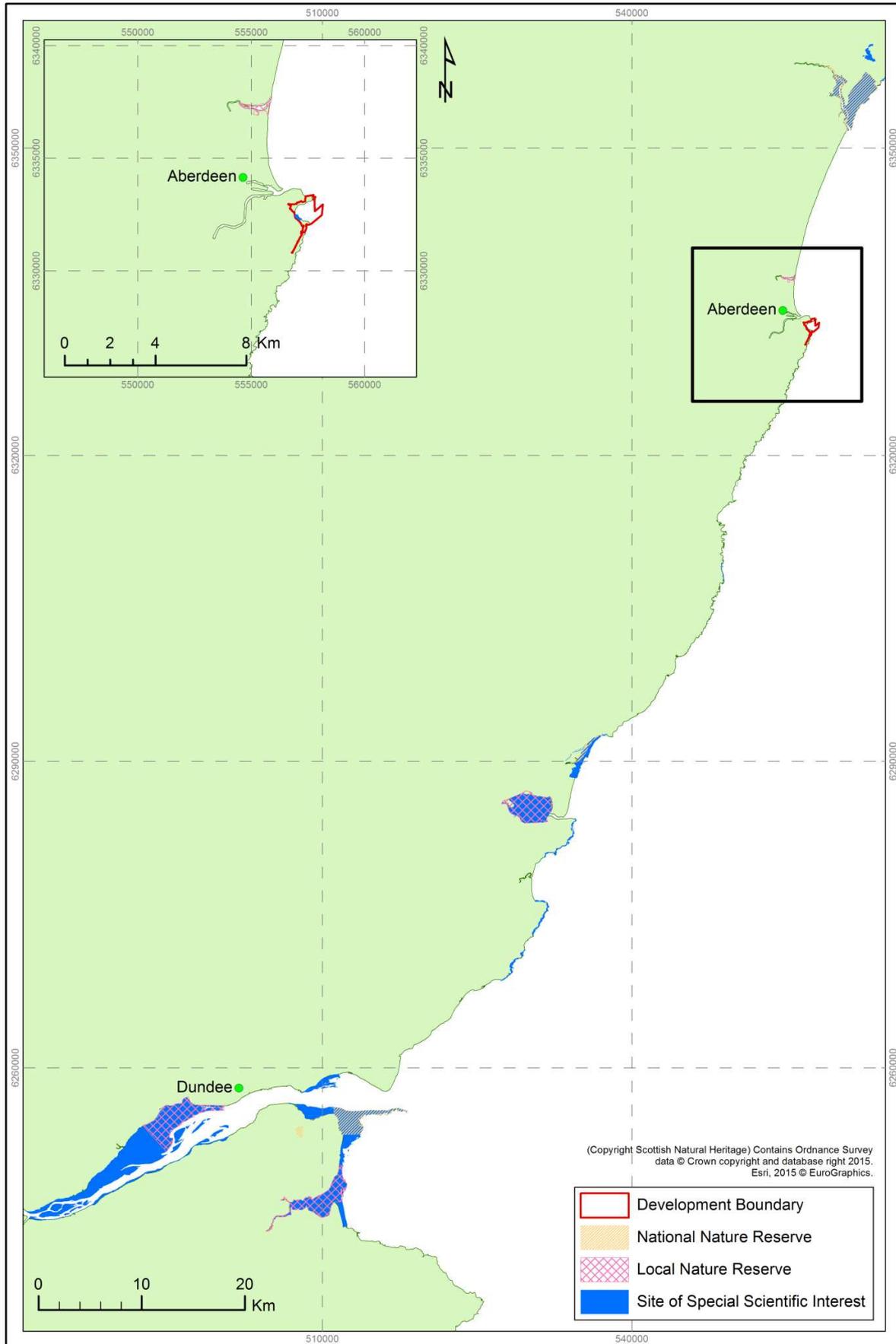
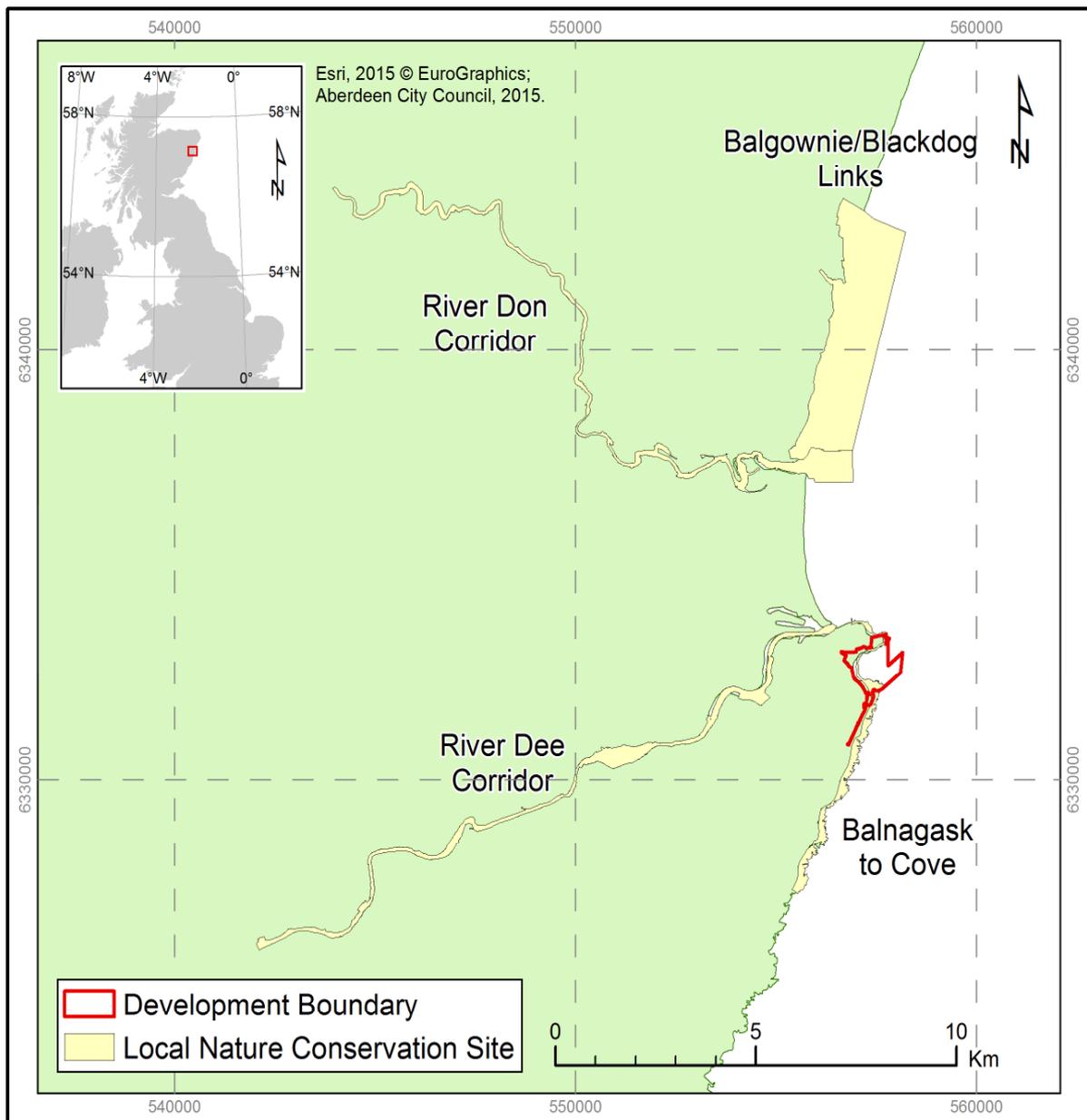


Figure 10.2: SSSI, NNR and LNR site designations to the north of Aberdeen



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Figure 10.3: SSSI, NNR and LNR site designations to the south of Aberdeen



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Figure 10.4: Aberdeen City Council LNCSs

10.2 Policy, Legislation and Guidance

This section outlines the policy, legislation and guidance that are relevant to designated sites. Policy, legislation and guidance applicable to the wider project can be found in Chapter 4: Planning and Legislation.

10.2.1 International

10.2.1.1 European Marine Sites (EMS)

European marine Natura 2000 sites are designated under two European Union directives:

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora was adopted in 1992 and is commonly known as the **Habitats Directive**;

- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds, commonly known as the **Birds Directive**, protects all wild birds, their nests, eggs and habitats within the European Community.

Natura 2000 is the term used to describe the Europe-wide network of protected sites developed under the European Commission Habitats Directive (Directive 92/43/EEC) - Special Areas of Conservation (SACs) - and the Birds Directive (79/409/EEC) - Special Protection Areas (SPAs).

The Conservation (Natural Habitats, &c.) Regulations 1994 as amended (the Habitats Regulations 1994), in combination with the Nature Conservation (Scotland) Act 2004, implements the EU Birds and Habitats Directives in the inshore area (The Scottish Government 2015). Where reserved matters (within the meaning of Schedule 5 of the Scotland Act 1998) are concerned, certain provisions of the Conservation of Habitats and Species Regulations 2010 (as amended) apply instead. Both sets of regulations require an equivalent process in relation to the assessment of plans and projects with the potential to affect European sites (SNH, 2013a).

Marine and transitional waters are protected areas under the Water Framework Directive (WFD). Objectives relating to coastal flooding can conflict with objectives relating to the conservation of habitats, with coastal flooding being prioritised within the WFD. Where SACs and SPAs occur in these areas, their objectives are also River Basin Management Plan (RBMP) objectives. In the context of RBMP, the estuaries and coastal waters where actions to reduce the risk of coastal flooding are required are those affected by habitat damage. However, it should be noted that in the Inverbervie to Girdle Ness coastal area all the water bodies are at good or better status; therefore, it is unlikely any opportunities to improve habitats will be prioritised (FRM Scotland, 2014).

10.2.1.2 Habitats Regulations Appraisal (HRA)

Article 6(3) of the Habitats Directive requires that any plan or project, which is not directly connected with or necessary to the management of a European site, but would be likely to have a significant effect on such a site, either individually or in combination with other plans or projects, shall be subject to an 'appropriate assessment' of its implications for the European site in view of the site's conservation objectives. Consequently, the Habitats Regulations 1994 require that certain plans which are likely to have a significant effect on a 'Natura 2000' site must be subject to an "appropriate assessment" by the plan-making authority before that plan can be adopted or submitted to Scottish Ministers. The process for determining whether an appropriate assessment is required, together with the appropriate assessment itself - where necessary - is known as 'Habitats Regulations Appraisal' (HRA).

Information to support the HRA process can be found in Volume 4 accompanying this ES.

10.2.1.3 European Protected Species (EPS)

The Habitats Regulations 1994 (as amended in Scotland) provide the protection afforded to European protected species (EPS) of animals and plants (those species listed on Annex IV of the Habitats Directive whose natural range includes Great Britain). EPS are listed on Schedules 2 (animals) and 4 (plants) of the Habitats Regulations 1994 (as amended) (SNH, 2014a). Part III of the Habitats Regulations details the protection given to European protected species of animals and plants. This

section also describes the licensing system which allows otherwise illegal activities to be carried out (SNH, 2013b). For EPS, Scottish Natural Heritage (SNH) issue licences for the majority of cases. Marine Scotland is the licensing authority for marine casework (SNH, 2014). Any EPS licences which are required for the Aberdeen Harbour Expansion Project will be applied for after consent has been granted and the detailed construction methodology is known.

10.2.1.4 Ramsar Convention

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention or Wetlands Convention) was adopted in Ramsar, Iran in February 1971. The Convention covers all aspects of wetland conservation and wise use. The UK ratified the Convention in 1976. All Ramsar sites in Scotland are also either co-designated as either Natura 2000 sites (SPAs or SACs) and/or Sites of Special Scientific Interest, although the designation boundaries may not always exactly match, and are protected under the relevant statutory regimes (The Scottish Government, 2011; The Scottish Government, 2014). This is in line with UK Government policy statements issued in relation to the special status of Ramsar sites which extends the same protection, at a policy level, to listed Ramsar sites in respect of new development as that afforded to sites which have been designated under the EC Birds and Habitats Directives as part of the EU Natura 2000 network (Joint Nature Conservation Committee (JNCC) 2015a).

10.2.1.5 OSPAR Convention

OSPAR is the mechanism by which western European governments work together to protect the marine environment of the north-east Atlantic Ocean. OSPAR incorporates a wide range of marine issues from work on pollution and dumping at sea to the conservation of marine biodiversity (SNH, 2013c).

In 2003, the government committed to establishing a well-managed, ecologically coherent network of Marine Protected Areas (known as the OSPAR MPA commitment). Marine SACs designated under the Habitats Directive have been submitted as the UK's initial contribution to the OSPAR network. The Marine (Scotland) Act 2010 and the UK Marine and Coastal Access Act 2009 contain provisions for new Marine Protected Areas (MPAs) in inshore and offshore waters, which will help Scotland meet this commitment (SNH, 2013).

The habitats and species on the OSPAR Threatened and Declining list have been considered through SNH's Priority Marine Features (PMFs) work to consider which ones are priorities for marine conservation in Scottish waters (SNH, 2013).

EMSs selected as OSPAR MPAs have been indicated in this chapter.

10.2.2 National

10.2.2.1 Sites of Special Scientific Interest (SSSI)

SSSIs are protected by law and SNH designates these sites under the Nature Conservation (Scotland) Act 2004. It is an offence for any person to intentionally or recklessly damage the protected natural features of an SSSI (SNH, 2015a).

SSSIs are those areas of land and water (to the seaward limits of local authority areas) that SNH considers to best represent Scotland's natural heritage in terms of diversity of plants, animals and habitats, rocks and landforms, or a combination of such natural features. SSSIs form the basis of nature conservation with, for example, SPAs and SACs, largely located on these sites (SNH, 2015).

10.2.2.2 Nature Conservation Marine Protected Areas (NCMPAs)

The Marine (Scotland) Act 2010 and the UK Marine and Coastal Access Act (2009) include powers for Scottish Ministers to designate Nature Conservation Marine Protected Areas (NCMPAs) in Scotland's seas as part of a range of measures to manage and protect Scotland's seas for current and future generations (JNCC, 2015b).

JNCC and SNH have applied Site Selection Guidelines to identify NCMPAs, which are underpinned by the presence of MPA search features. MPA search features include conservation mechanisms which apply to Scotland's seas and list features of conservation importance, for example, OSPAR, Biodiversity Action Plans, the Scottish Biodiversity Strategy and the EC Habitats and Birds Directives. In finalising a list of search features, JNCC and SNH included Priority Marine Features (PMFs) captured by these mechanisms. NCMPA search features mostly comprise PMFs for which MPA designation is considered the most appropriate conservation measure. The process also helps Scotland meet its contribution to UK commitments under international conventions and legislation such as the Convention on Biological Diversity, and the OSPAR Convention for an ecologically coherent network of MPAs (JNCC, 2015).

10.2.2.3 National Nature Reserves (NNRs)

NNRs are declared by the statutory country conservation agencies under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981. In Scotland, whilst SNH remains the statutory designating authority, decisions to declare new NNRs and manage existing ones are shared with a Partnership Group of interested organisations (including public, private, community and voluntary organisations).

10.2.3 Local

10.2.3.1 Local Nature Reserves (LNRs)

LNRs are a statutory designation declared by Local Authorities as per the National Parks and Access to the Countryside Act 1949. With assistance from SNH, designation is awarded for the protection of sites of local importance for nature conservation, education and amenity. Managing rules or bye-laws set up by Local Authorities can be used to control damaging activities.

10.2.3.2 Local Nature Conservation Sites (LNCS)

This is a non-statutory local designation identified by Local Authorities under the Scottish Government's Scottish Planning Policy. Protection is afforded through the Council's Local Development Plan (LDP). These sites are of local importance for nature conservation. Councils have a biodiversity duty under the Nature Conservation Scotland Act (2004) to further the conservation of biodiversity when carrying out all their functions and to take measures to enhance biodiversity where possible. Section 1 of the 2004 states that "it is the duty of every public body and office-holder, in

exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions".

The identification and protection of LNCSs by Local Authorities was an action identified in the Scottish Biodiversity Strategy Action Plans 2004-8 and is one measure which can be taken to protect biodiversity. It also supports the implementation of the North-East Local Biodiversity Action Plan in which, for example, Aberdeenshire Council is a partner. Scottish Planning Policy states that 'international and national designations can be complemented by local designations which protect, enhance and encourage the enjoyment and understanding of locally important landscapes and natural heritage. Local designations should be clearly identified and protected through the development plan'.

10.3 Consultation

Aberdeen Harbour Board (AHB) submitted an EIA Scoping Report in 2013 (ES Appendix 1-C) to the regulators and consultees listed in Chapter 5: EIA Process, including Marine Scotland, SNH and Aberdeen City Council. Transport Scotland issued a Scoping Opinion in January 2014 (ES Appendix 1-D). The Scoping Report was updated in April 2014 to take account of the Scoping Opinion (ES Appendix 1-E: Updated Scoping Report 2014). A summary of all responses to the Scoping Opinion relevant to the Nature Conservation chapter, and links to the locations within the ES where they are addressed, are provided in Table 10.1.

Information on SAC and SPA designations is included in this chapter, and as such there is overlap and read-across with the HRA report (Volume 4: Habitats Regulations Assessment).

Table 10.1: Summary of Scoping Opinion responses and links to where these have been addressed within the ES

Organisation	Relevance	Comment	Response
SNH	Hydrodynamics, Sediments and Coastal Processes	Please note that the term 'Marine Conservation Zone' is being used by England and Wales. In Scottish waters, Marine Protection Areas is the term being used. However, the closest such areas are the Southern Trench and Turbot Bank which would not be affected by this proposal.	Noted in this Chapter, Section 10.4.6.
	Hydrodynamics, Sediments and Coastal Processes	Section 5.53 states that "Preliminary desk assessments suggest that the waves will try to straighten the beach out by pushing sediment from south to north. This could lead to some erosion on the southern side of the beach (below the SSSI) and minor depositions on the northern part of the remaining beach." It is technically correct that MLWS is the designated boundary, but if it erodes the subtidal beach face then it affects the designated site in the same way.	Chapter 6, Marine Physical Environment; this Chapter, Section 10.4.5.1.
	SSSI (Nature Conservation)	SNH agree with management objective and potential impacts identified for Nigg Bay SSSI. The specific issue is how the development could change coastal erosion processes, and therefore the stability, survival and accessibility of the coastal cliff exposures. SNH support the use of a hydrodynamic study to investigate how the proposal might alter erosive processes at the base of the cliff.	Chapter 6, Marine Physical Environment; this Chapter, Section 10.4.5.1.
Marine Scotland (MS)	Ornithology	Although there may be small aggregations of sandeels, any impacts to these are unlikely to be significant at the population level. These may, however, be important for local birds and this must be considered.	Only Turbot bank is specifically designated for sandeel and this site was scoped out by SNH in their response. Potential impacts on birds are considered fully in Chapter 14, Marine Ornithology.
Dee District Salmon Fishery Board	Diadromous Fish - Fish and Shellfish	The proposal is located adjacent to the main stem of the River Dee and is on a direct migration pathway for Atlantic salmon. The Dee has been designated as a Special Area of Conservation under the EC Habitats Directive 92/43 EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna, for Atlantic salmon, Freshwater Pearl Mussels and Otters. Please note that in terms of this legislation the Dee DSFB is a competent authority on developments that may impact upon Atlantic salmon.	Chapter 13, Fish and Shellfish; Volume 4: HRA; this Chapter, Section 10.4.2.1.
		Dee District Salmon Fishery Board believe the issues that require the greatest level of detail relate to Atlantic salmon due to the designation of the Dee as a Special Area of Conservation.	Chapter 13, Fish and Shellfish; Volume 4: HRA; this Chapter, Section 10.4.2.1.

Table 10.1: Summary of Scoping Opinion responses and links to where these have been actioned continued

Organisation	Relevance	Comment	Response
Marine Scotland (MS)	Diadromous Fish - Fish and Shellfish	If any significant effects on salmon populations are anticipated, information will be required to assess whether there is likely to be any significant effect of developments on any rivers which are classified as Special Areas of Conservation (SACs) for Atlantic salmon under the Habitats Directive. The River Dee will certainly need [to be] included for HRA consideration with respect to its salmon population, but the developers should also note that marine developments have the potential to impact on migratory fish populations at substantial distances from the development site.	Chapter 13, Fish and Shellfish; Volume 4: HRA; this Chapter, Section 10.4.2.1.
Whale and Dolphin Conservation (WDC)	Marine Mammals	WDCS has serious concerns about the effect of construction and operation of the proposed harbour extension on marine mammals, especially bottlenose dolphin. Connectivity of bottlenose dolphins between the Moray Firth Special Area of Conservation (SAC) and Aberdeen Harbour has been well documented e.g. Weir et al. (2006) and Cheney et al. (2013).	Chapter 15, Marine Mammals; Volume 4: HRA; this Chapter Section 10.4.2.2.
		Our main concerns are that there will be a significant effect on marine mammals due to underwater noise from pile driving and dredging, and increased vessel traffic during construction and operation. Aberdeen Harbour is an important area for bottlenose dolphins to forage. A recent study by Pirootta et al. (2013) found that bottlenose dolphins left Aberdeen harbour for five weeks whilst dredging activity occurred in the area. Although the timing of work has not been documented in the Scoping Report, construction of AHD will exceed five weeks, and is likely to cause a significant effect on animals in the area. Alternative methods to pile driving should be investigated to reduce noise impacts. If pile driving is used, a noise-reducing barrier (such as a bubble curtain) should be maintained around the source to mitigate the impacts of radiated noise levels. The barrier should remain in place until piling has been completed.	Chapter 15, Marine Mammals; Volume 4: HRA; this Chapter Section 10.4.2.2.
Marine Scotland (MS)	Marine Mammals	MS consider that the bottlenose dolphins using the east coast of Scotland are a single population and therefore MS believe that potential impacts in the area around the Aberdeen Harbour development must be assessed with respect to the Moray Firth SAC. The 'Cumulative Impacts' section (4.18) lists a number of projects for consideration and states that the list will be developed and updated throughout the EIA process and agreed with relevant authorities prior to the submission of the application for AHD. MS agree with this approach and emphasise the requirement to take into account the whole East Coast area when considering which projects should be included.	Chapter 15, Marine Mammals; Volume 4: HRA; this Chapter Section 10.4.2.2.

Table 10.1: Summary of Scoping Opinion responses and links to where these have been actioned continued

Organisation	Relevance	Comment	Response
SNH	Underwater Noise	The assessment should take into account the likely behaviour responses of relevant fish. Not all fish will flee in response to underwater noise, for example, some might bury themselves in the sea bed. The assessment should focus on, but not be exclusive to, species with the highest expected sensitivities to underwater noise (e.g. herring, cod). It should also focus on Atlantic salmon, as they are a feature of the River Dee SAC, which is very close to the development area.	Chapter 13, Fish and Shellfish; Volume 4: HRA; this Chapter, Section 10.4.2.1.
	Approach and Methodology	Section 5.128 suggests wider studies to "establish possible connectivity" to SACs. For bottlenose dolphin this is not required as it has been already proven and accepted.	Chapter 15, Marine Mammals; Volume 4: HRA; this Chapter Section 10.4.2.2.
	Approach and Methodology	Grey seals occur throughout Scottish waters. Analysis of seal telemetry data by SMRU (SNH Commissioned Report 441: Utilisation of space by grey and harbour seals in the Pentland Firth and Orkney waters 2011) has shown that grey seals tagged in both the Isle of May SAC and Berwickshire and North Northumberland Coast SAC appear to routinely travel past Aberdeen (through the proposed location) on their way to the Pentland Firth. The proportion of the SAC populations that travels in this way is not known nor how long they remain in this area for.	Chapter 15, Marine Mammals; Volume 4: HRA; this Chapter Section 10.4.2.5 and 10.4.2.6.
	Approach and Methodology	<p>The telemetry study showed that harbour seals tend to be more limited in their movements (foraging distances - approx 50km) than grey seals and stay in the same area. The Firth of Tay and Eden Estuary SAC is approximately 80km from the development site and would normally be considered outwith 'normal' harbour seal foraging range. It would therefore be exceptional that harbour seals found in the vicinity of the proposed development are from either this SAC or the Dornoch Firth SAC - the two closest harbour seal SACs.</p> <p>However, this subject is being reviewed as more information becomes available on the harbour seal population and the causes of its decline. The applicant will need to provide evidence as to whether or not there is a likely significant effect and we are happy to assist with this.</p>	Chapter 15, Marine Mammals; Volume 4: HRA; this Chapter, Section 10.4.2.4 and 10.4.2.3.

Table 10.1: Summary of Scoping Opinion responses and links to where these have been actioned continued

Organisation	Relevance	Comment	Response
Aberdeen City Council (ACC)	Socio-economics	Page 24 - section 5.17 - Land Use - [of the Scoping report] makes reference to District Wildlife Sites within the Aberdeen Local Development Plan (ALDP) 2012. These designations no longer exists and are now called Local Nature Conservation Sites (LNCS). This paragraph should also make reference to the Site of Special Scientific Interest (SSSI) which is also noted within the ALDP.	This Chapter, Section 10.2.3.2 and 10.2.2.1.
	Nature Conservation	Page 34 - Section 5.93 - Local and National Designations - The Moray Firth Special Area of Conservation (SAC) should be included in this table as the qualifying species (bottlenose dolphins) are regularly found at the River Dee SAC. The Moray Firth SAC is a matter for consideration in the 2012 ALDP.	This Chapter, Section 10.4.2.2.
	Nature Conservation	Page 34/35 - Table 5.4 - it is not clear why the nature conservation designations, LNCS, are not included in this table. They are mentioned in the preceding paragraph, section 5.93. They are listed in section 5.95, however, it feels that they are being treated as an afterthought and perhaps not as important? They may be local designated sites, but they are designated sites for nature conservation nevertheless, and should be included in Table 5.4 giving their distances, size and conservation interests just like the other designations.	This Chapter, Section 10.2.3.2 and 10.4.9.
	Nature Conservation	Page 36 - first paragraph under Biodiversity Action Plan (BAP) Habitats and Species - should be (NELBAP) as opposed to (LBAP).	This Chapter, Section 10.2.3.2.
	Fish and Shellfish	Page 37 - Section 5.101 - Key Issues/ Baseline Overview - insert the word 'Local' after 'Scotland' - i.e. should say 'North-east Scotland Local Biodiversity Action Plan'.	This Chapter, Section 10.2.3.2.
Scottish Environmental Protection Agency	Estuarine Ecology	We note that the River Dee SAC is located nearby. Advice on designated sites and European Protected Species should be sought from SNH. For marine and transitional Special Areas of Conservation (SAC) and Special Protected Areas (SPA), these are Water Framework Directive (WFD) Protected Areas. Therefore, their objectives are also River Basin Management Plan objectives.	Chapter 7, Marine Water and Sediment Quality; this Chapter, Section 10.2.1.
SNH	HRA	The Scottish Government has chosen as a matter of policy to apply the same considerations to the protection of Ramsar sites as if they were classified as SPAs.	This Chapter, Sections 10.2.1.4 and 10.4.4; Volume 4: HRA.

10.4 Baseline

10.4.1 Overview

This section identifies the qualifying habitats and species associated with the wide range of designated sites captured within this chapter that could potentially interact with the proposed development. It was guided by the consultation responses detailed in Section 10.3. Cross references to the relevant chapters within the ES where each qualifying or notifying feature is assessed are supplied for each site.

10.4.2 International Designations: Special Areas of Conservation (SACs)

SACs are sites designated under the European Habitats Directive (EU Directive 92/43/EEC on the conservation of habitats and wild flora and fauna). As such they form part of the European network of Natura 2000 sites, a term given to both SACs and those locations designated as Special Protection Areas (SPAs) under the Birds Directive.

The six SACs identified by SNH as relevant to the proposed development are included in Figure 10.1 and Table 10.2 and the potential effects are listed in Table 10.3. The Sands of Forvie SAC has not been included as the interest features are all supralittoral and will be unaffected by the proposed development.

Table 10.2: SACs with connectivity to the Aberdeen Harbour Expansion Project

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
River Dee	2	Annex II species (primary reason for site selection)	
		Atlantic salmon (<i>Salmo salar</i>)	Favourable, maintained
		Freshwater pearl mussel (<i>Margaritifera margaritifera</i>)	Unfavourable, no change
		Otter (<i>Lutra lutra</i>)	Favourable, maintained
Moray Firth [^]	160	Annex II species (primary reason for site selection)	
		Bottlenose dolphin (<i>Tursiops truncatus</i>)	Favourable, recovered
Firth of Tay and Eden Estuary [^]	86	Annex II species (primary reason for site selection)	
		Harbour seal (<i>Phoca vitulina</i>)	Unfavourable, declining
Isle of May [^]	110	Annex II species (primary reason for site selection)	
		Grey seal (<i>Halichoerus grypus</i>)	Favourable, maintained
Berwickshire and North Northumberland Coast	132	Annex II species that are a primary reason for selection of this site	
		Grey seal (<i>Halichoerus grypus</i>)	Favourable, maintained
Dornoch Firth and Morrich More [^]	195	Annex II species that are a primary reason for selection of this site	
		Grey seal (<i>Halichoerus grypus</i>)	Unfavourable recovering
Notes:			
* This is an approximate distance by sea from the proposed development			
[^] OSPAR MPA sites			

Table 10.3: Potential effects of the Aberdeen Harbour Expansion Project on designated features as identified by SNH

1	Noise and vibration from dredging, piling, drilling and blasting, and from construction and traffic movements, primarily during the construction phase.
2	Reduced water quality from increased suspended solids and reduced dissolved oxygen as a result of piling and dredging, as well as associated potential release of contaminants during both the construction and operation phases.
3	Lighting effects during construction and operation.
4	Physical disturbance for example, injury from collision with vessels during construction and operation.
5	Indirect effects of prey availability during construction and operation.

Descriptions of those SACs with perceived connectivity with the development are provided below.

10.4.2.1 River Dee SAC

The Dee is a major east coast Scottish river, which flows uninterrupted for approximately 130 km from its upland reaches in the high Cairngorms to the North Sea (Table 10.2; Figure 10.2). There is a weak nutrient gradient along its length, but it is essentially a nutrient-poor river. The SAC covers an area of 2,446.82 hectares (ha) (JNCC, 2015d).

In the Scoping Opinion (ES Appendix 1-D) SNH identified that the development had the potential to have a Likely Significant Effect (LSE) on two of the qualifying features of the River Dee SAC: Atlantic salmon and freshwater pearl mussel. Potential effects of the proposed development on salmon were identified by SNH as comprising effects 1 to 4 in Table 10.3. Freshwater pearl mussel are not present within the development site; however, their populations rely on migrating salmon, so effects on salmonids could have subsequent effects on pearl mussels. The relevant chapters assessing the potential effects on the features of the SAC are Volume 4: HRA and Chapter 13: Fish and Shellfish Ecology.

At the time the Scoping Opinion was produced, otter were not known to occur in the proposed development area, and SNH considered that, if present, otter would only be present in small numbers, and therefore the development would not have an LSE on the River Dee SAC and would not lead to an adverse effect on site integrity. Subsequent otter surveys undertaken by AHB found evidence of otter presence on Girdle Ness and Greg Ness – otter spraints (droppings) and feeding signs. Further consideration of the effects of the proposed development on otter are provided in Chapter 11: Terrestrial Ecology, and further consideration of the potential LSE on the River Dee SAC is provided in Volume 4: HRA.

10.4.2.2 Moray Firth SAC

The Moray Firth supports the only known resident population of bottlenose dolphin *Tursiops truncatus* in the North Sea. This Annex II species is the primary reason for site selection and was last assessed as being in ‘favourable recovered’ condition. The population is estimated to be around 130 individuals (Wilson et al., 1999). Dolphins are present all year round, and, while they range widely in the Moray Firth, they appear to favour particular areas. The SAC covers an area of 15,1347.17 ha (JNCC, 2015e).

The SAC is also designated for the Annex I habitat 'Sandbanks which are slightly covered by sea water all the time'. This is a qualifying feature but not a primary reason for site designation and no connectivity with the proposed development is predicted given the large intervening distance (refer to ES Appendix 1-D: Scoping Opinion 2014).

Potential effects of the proposed development on bottlenose dolphin were identified by SNH as comprising points 1 to 6 (Table 10.3) with relevant assessments available in Chapter 15: Marine Mammals and Volume 4: HRA.

10.4.2.3 Dornoch Firth and Morrich More SAC

The Dornoch Firth is fed by the Kyle of Sutherland and is the most northerly large, complex estuary in the UK. There is a complete transition from riverine to fully marine conditions and associated communities and the estuary is largely unaffected by industrial development. The site supports a significant proportion of the inner Moray Firth population of the harbour or common seal *Phoca vitulina* and accounts for almost 2% of the UK population. The seals, which utilise sand-bars and shores at the mouth of the estuary as haul-out and breeding sites, are the most northerly population to utilise sandbanks. The SAC covers an area of 8,700.53 ha (JNCC, 2015f).

As indicated by the Natura 2000 UK standard data form, the majority of the site is owned by the Ministry of Defence, and management is discussed regularly at a Ministry of Defence Conservation Group. A pipeline construction corridor runs through the middle of Morrich More; use of the dunes by vehicles, and grazing levels, are monitored and reviewed. The site contains a long-established wild mussel fishery, which is managed sustainably, and the collection of shellfish (other than mussels) by mechanical means is controlled by a Nature Conservation Order made under the Wildlife and Countryside Act 1981 (JNCC, 2015f).

The SAC is designated for an extensive number of Annex I habitats, none of which have any connectivity with the proposed development given the large intervening distance and are therefore not considered further within this ES (JNCC, 2015c; and ES Appendix 1-D: Scoping Opinion 2014).

Potential effects of the proposed development on common/harbour seal were identified by SNH as comprising points 1, 2, 3 and 5 (Table 10.3) with relevant assessments available in Chapter 15: Marine Mammals and Volume 4: HRA.

10.4.2.4 Firth of Tay and Eden Estuary SAC

The Firth of Tay and Eden Estuary SAC supports a nationally important breeding colony of common/harbour seal *Phoca vitulina*, part of the east coast population of common seals that typically utilise sandbanks. This Annex II species is a primary reason for site selection. The estuarine areas in both are considered to be of high quality and have been designated as a single site because they are integral components of a large, geomorphologically complex area that incorporates a mosaic of estuarine and coastal habitats. The Tay is the least modified of the large east coast estuaries in Scotland, while the Eden estuary represents a smaller 'pocket' estuary. The inner parts of the estuaries are largely sheltered from wave action, while outer areas, particularly of the Tay, are exposed to strong tidal streams, giving rise to a complex pattern of erosion and deposition of the sandbank feature at the firth's mouth. The sediments within the site support biotopes that reflect the

gradients of exposure and salinity, are typical of estuaries on the east coast of the UK and are considered ecologically representative of northern North Sea estuaries. The SAC covers an area of 15,412.53 ha (JNCC, 2015g).

The Natura 2000 UK standard data form states that within the SAC Tentsmuir Point is a National Nature Reserve and parts of the Eden Estuary and Inner Tay Estuary are Local Nature Reserves. Vulnerability issues are being addressed through the management plan for the National Nature Reserve which also has a resident warden. Issues that arise from elsewhere are dealt with via a wider management plan for the whole site. Aggregate removal occurs in the Firth of Tay, but there are no apparent adverse effects of the Natura interests (JNCC, 2015g). The site is also part of the suite of UK OSPAR MPA sites.

The SAC is designated for a number of Annex I habitats, none of which have any connectivity with the proposed development given the large intervening distance and are therefore not considered further within this ES (JNCC, 2015g and ES Appendix 1-D: Scoping Opinion 2014).

Potential effects of the proposed development on harbour seal were identified by SNH as comprising points 1, 2, 3 and 5 (Table 10.3) with relevant assessments available in Chapter 15: Marine Mammals and Volume 4: HRA.

10.4.2.5 Isle of May SAC

The Isle of May, lying at the entrance to the Firth of Forth on the east coast of Scotland, supports a breeding colony of grey seals *Halichoerus grypus*. The site, which is owned and managed by SNH, is the largest east coast breeding colony of grey seals in Scotland and the fourth largest breeding colony in the UK, contributing approximately 4.5% of annual UK pup production. The SAC covers an area of 356.75 ha (JNCC, 2015h).

The SAC is designated for Annex I Reef but no connectivity with the proposed development is envisaged given the large intervening distance and this feature is therefore not considered further within this ES (JNCC, 2015a and ES Appendix 1-D: Scoping Opinion 2014).

Potential effects of the proposed development on grey seal were identified by SNH as comprising points 1, 2, 3 and 5 (Table 10.3) with relevant assessments available in Chapter 15: Marine Mammals and Volume 4: HRA.

10.4.2.6 Berwickshire and North Northumberland Coast SAC

This is an extensive and diverse stretch of coastline in north-east England and south-east Scotland. There is variation in the distribution of features of interest along the coast. The north-east England coastal section is representative of grey seal *Halichoerus grypus* breeding colonies in the south-east of its breeding range in the UK. It is the most south-easterly site selected for this species, and supports around 2.5% of annual UK pup production. As identified in the Natura 2000 UK standard data form, much of the inshore area in Scotland is a voluntary Marine Nature Reserve. The SAC covers an area of 65,045.5 ha (JNCC, 2015i).

The SAC is designated for a number of Annex I habitats, none of which have any connectivity with the proposed development given the large intervening distance and they are therefore not considered further within this ES (JNCC, 2015i and ES Appendix 1-D: Scoping Opinion 2014).

Potential effects of the proposed development on grey seal were identified by SNH as comprising points 1, 2, 3 and 5 (Table 10.3) with relevant assessments available in Chapter 15: Marine Mammals and Volume 4: HRA.

10.4.2.7 Draft Special Areas of Conservation (dSACs)

It is understood that a suite of dSACs are in development for the UK. Of those in Scottish waters, one would be of potential relevance to the proposed development: the 'Outer Moray Firth dSAC' with harbour porpoise identified as the qualifying species. However, there is no published information on these potential designations and therefore in line with the advice from SNH (2014b) on other European Marine Sites i.e. the proposed dSPAs (see Section 10.4.3.10), these draft designations will not, at this stage, be considered further within either the HRA or ES until ministerial approval is obtained. This is in line with information published by SNH (2013a) on the 'Legislative Requirements for European Sites'.

10.4.3 **International Designations: Special Protection Areas (SPAs)**

Special Protection Areas (SPAs) are classified under the Birds Directive (EC Directive on the conservation of wild birds - 2009/147/EC) to protect rare, vulnerable and migratory birds. As such they form part of the European network of Natura sites, a term given to both SPAs and those locations designated as SACs under the Habitats Directive. Nine SPAs have been considered in this section (as listed in Table 10.4). Foraging ranges which informed decisions on connectivity are also provided (in Table 10.5).

Table 10.4: SPAs considered within the assessment

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Ythan Estuary, Sands of Forvie and Meikle Loch	20	Article 4.1 of the Directive (Annex I Species)	
		Little tern (<i>Sternula albifrons</i>), breeding	Favourable, maintained
		Common tern (<i>Sterna hirundo</i>), breeding	Unfavourable, no change
		Sandwich tern (<i>Sterna sandvicensis</i>), breeding	Favourable, maintained
		Article 4.2 of the Directive (Migratory Species)	
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Article 4.2 of the Directive (Assemblage qualification)	
		Waterfowl assemblage, non-breeding including:	Favourable, maintained
		• Lapwing (<i>Vanellus vanellus</i>);	Favourable, maintained
		• Eider (<i>Somateria mollissima</i>);	Favourable, maintained
		• Redshank (<i>Tringa totanus</i>);	Favourable, maintained
• Pink-footed goose (<i>Anser brachyrhynchus</i>).	Favourable, maintained		
Buchan Ness to Collieston Coast [^]	23	Article 4.2 of the Directive (Assemblage qualification)	
		Seabird assemblage, breeding including:	Unfavourable, no change
		• Guillemot (<i>Uria aalge</i>);	Favourable, declining
		• Kittiwake (<i>Rissa tridactyla</i>);	Unfavourable, no change
		• Fulmar (<i>Fulmarus glacialis</i>);	Unfavourable, declining
		• Shag (<i>Phalacrocorax aristotelis</i>);	Unfavourable, no change
• Herring gull (<i>Larus argentatus</i>).	Unfavourable, no change		
Loch of Strathbeg	60	Article 4.1 of the Directive (Annex I Species)	
		Sandwich tern (<i>Sterna sandvicensis</i>), breeding	Unfavourable, declining
		Svalbard Barnacle goose (<i>Branta leucopsis</i>), non-breeding	Favourable, maintained
		Whooper swan (<i>Cygnus cygnus</i>), non-breeding	Favourable, maintained
		Article 4.2 of the Directive (Migratory Species)	
		Greylag goose (<i>Anser anser</i>), non-breeding	Unfavourable, no change
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Article 4.2 of the Directive (Assemblage qualification)	
		Waterfowl assemblage, non-breeding including:	Favourable, maintained
		• Teal (<i>Anas crecca</i>);	Favourable, maintained
		• Greylag goose (<i>Anser anser</i>);	Unfavourable, no change
		• Pink-footed goose (<i>Anser brachyrhynchus</i>);	Favourable, maintained
		• Svalbard Barnacle goose (<i>Branta leucopsis</i>);	Favourable, maintained
• Whooper swan (<i>Cygnus cygnus</i>).	Favourable, maintained		
Notes:			
* This is an approximate distance by sea from the proposed development			
[^] OSPAR MPA sites			

Table 10.4: SPAs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Troup, Pennan and Lion's Heads [^]	85	Article 4.2 of the Directive (Migratory Species)	
		Guillemot (<i>Uria aalge</i>), breeding	Unfavourable, declining
		Article 4.2 of the Directive (Assemblage qualification)	
		Seabird assemblage, breeding including:	Unfavourable, declining
		• Razorbill (<i>Alca torda</i>);	Unfavourable, declining
		• Kittiwake (<i>Rissa tridactyla</i>);	Unfavourable, no change
		• Herring gull (<i>Larus argentatus</i>);	Unfavourable, no change
		• Fulmar (<i>Fulmarus glacialis</i>);	Unfavourable, declining
• Guillemot (<i>Uria aalge</i>).	Unfavourable, declining		
Fowlsheugh [^]	23	Article 4.2 of the Directive (Migratory Species)	
		Guillemot (<i>Uria aalge</i>), breeding	Favourable, maintained
		Kittiwake (<i>Rissa tridactyla</i>), breeding	Favourable, maintained
		Article 4.2 of the Directive (Assemblage qualification)	
		Seabird assemblage, breeding including:	Favourable, maintained
		• Razorbill (<i>Alca torda</i>);	Favourable, maintained
		• Herring gull (<i>Larus argentatus</i>);	Unfavourable, declining
		• Fulmar (<i>Fulmarus glacialis</i>);	Favourable, maintained
• Guillemot (<i>Uria aalge</i>);	Favourable, maintained		
• Kittiwake (<i>Riss tridactyla</i> .)	Favourable, maintained		
Montrose Basin [^]	58	Article 4.2 of the Directive (Migratory Species)	
		Greylag goose (<i>Anser anser</i>), non-breeding	Unfavourable, no change
		Knot (<i>Calidris canutus</i>), non-breeding	Favourable, maintained
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Redshank (<i>Tringa totanus</i>), non-breeding	Favourable, maintained
		Article 4.2 of the Directive (Assemblage qualification)	
		Waterfowl assemblage, non-breeding including:	Favourable, maintained
		• Dunlin (<i>Calidris alpina alpina</i>);	Favourable, maintained
		• Oystercatcher (<i>Haematopus ostralegus</i>);	Favourable, maintained
		• Eider (<i>Somateria mollissima</i>);	Favourable, maintained
		• Wigeon (<i>Anas penelope</i>);	Favourable, maintained
		• Shelduck (<i>Tadorna tadorna</i>);	Favourable, maintained
		• Redshank (<i>Tringa totanus</i>);	Favourable, maintained
• Knot (<i>Calidris canutus</i>);	Favourable, maintained		
• Greylag goose (<i>Anser anser</i>);	Favourable, maintained		
• Pink-footed goose (<i>Anser brachyrhynchus</i>).	Favourable, maintained		
Notes:			
* This is an approximate distance by sea from the proposed development			
[^] OSPAR MPA sites			

Table 10.4: SPAs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Montrose Basin^ Continued	58	Article 4.2 of the Directive (Assemblage qualification)	
		Waterfowl assemblage, non-breeding including:	Favourable, maintained
		• Dunlin (<i>Calidris alpina alpina</i>);	Favourable, maintained
		• Oystercatcher (<i>Haematopus ostralegus</i>);	Favourable, maintained
		• Eider (<i>Somateria mollissima</i>);	Favourable, maintained
		• Wigeon (<i>Anas penelope</i>);	Favourable, maintained
		• Shelduck (<i>Tadorna tadorna</i>);	Favourable, maintained
		• Redshank (<i>Tringa totanus</i>);	Favourable, maintained
		• Knot (<i>Calidris canutus</i>);	Favourable, maintained
		• Greylag goose (<i>Anser anser</i>);	Favourable, maintained
• Pink-footed goose (<i>Anser brachyrhynchus</i>).	Favourable, maintained		
Firth of Tay and Eden Estuary^	86	Article 4.1 of the Directive (Annex I Species)	
		Little tern (<i>Sternula albifrons</i>), breeding	Unfavourable, no change
		Bar-tailed godwit (<i>Limosa lapponica</i>), non-breeding	Favourable, maintained
		Marsh harrier (<i>Circus aeruginosus</i>), breeding	Favourable, maintained
		Article 4.2 of the Directive (Migratory Species)	
		Greylag goose (<i>Anser anser</i>), non-breeding	Favourable, declining
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Unfavourable, no change
		Redshank (<i>Tringa totanus</i>), non-breeding	Favourable, maintained
		Article 4.2 of the Directive (Assemblage qualification)	
		Waterfowl assemblage, non-breeding including:	Favourable, maintained
		• Velvet scoter (<i>Melanitta fusca</i>);	Favourable, maintained
		• Pink-footed goose (<i>Anser brachyrhynchus</i>);	Unfavourable, no change
		• Greylag goose (<i>Anser anser</i>);	Favourable, declining
		• Redshank (<i>Tringa totanus</i>);	Favourable, maintained
		• Cormorant (<i>Phalacrocorax carbo</i>);	Favourable, maintained
		• Shelduck (<i>Tadorna tadorna</i>);	Favourable, maintained
		• Eider (<i>Somateria mollissima</i>);	Unfavourable, no change
		• Bar-tailed godwit (<i>Limosa lapponica</i>);	Favourable, maintained
		• Icelandic Black-tailed godwit (<i>Limosa limosa islandica</i>);	Favourable, maintained
		• Common scoter (<i>Melanitta nigra</i>);	Unfavourable, no change
		• Goldeneye (<i>Bucephala clangula</i>);	Favourable, maintained
		• Red-breasted merganser (<i>Mergus serrator</i>);	Unfavourable, no change
• Goosander (<i>Mergus merganser</i>);	Favourable, maintained		
• Oystercatcher (<i>Haematopus ostralegus</i>);	Favourable, recovered		
Notes:			
* This is an approximate distance by sea from the proposed development			
^ OSPAR MPA sites			

Table 10.4: SPAs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Firth of Tay and Eden Estuary^ Continued	86	• Grey plover (<i>Pluvialis squatarola</i>);	Favourable, maintained
		• Sanderling (<i>Calidris alba</i>);	Favourable, recovered
		• Dunlin (<i>Calidris alpina alpina</i>);	Unfavourable, no change
		• Long-tailed duck (<i>Clangula hyemalis</i>).	Unfavourable, declining
Firth of Forth	101	Article 4.1 of the Directive (Annex I Species)	
		Red-throated diver (<i>Gavia stellata</i>), non-breeding	Favourable maintained
		Oystercatcher (<i>Haematopus ostralegus</i>), non-breeding	Favourable maintained
		Bar-tailed godwit (<i>Limosa lapponica</i>), non-breeding	Favourable declining
		Golden plover (<i>Pluvialis apricaria</i>), non-breeding	Favourable maintained
		Great crested grebe (<i>Podiceps cristatus</i>), non-breeding	Unfavourable declining
		Sandwich tern (<i>Sterna sandvicensis</i>), passage	Favourable declining
		Article 4.2 of the Directive (Migratory Species)	
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable maintained
		Turnstone (<i>Arenaria interpres</i>), non-breeding	Favourable maintained
		Knot (<i>Calidris canutus</i>), non-breeding	Unfavourable declining
		Shelduck (<i>Tadorna tadorna</i>), non-breeding	Favourable declining
		Redshank (<i>Tringa totanus</i>), non-breeding	Favourable maintained
		Article 4.2 of the Directive (Assemblage qualification)	
		Waterfowl assemblage, non-breeding including:	Favourable declining
		• Red-throated diver (<i>Gavia stellata</i>), non-breeding;	Favourable maintained
		• Great crested grebe (<i>Podiceps cristatus</i>), non-breeding;	Unfavourable declining
		• Slavonian grebe (<i>Podiceps auritus</i>), non-breeding;	Favourable declining
		• Cormorant (<i>Phalacrocorax carbo</i>), non-breeding;	Favourable maintained
		• Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding;	Favourable maintained
• Shelduck (<i>Tadorna tadorna</i>), non-breeding;	Favourable declining		
• Wigeon (<i>Anas penelope</i>), non-breeding;	Favourable recovered		
• Mallard (<i>Anas platyrhynchos</i>), non-breeding;	Unfavourable declining		
Notes:			
* This is an approximate distance by sea from the proposed development			
^ OSPAR MPA sites			

Table 10.4: SPAs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Firth of Forth Continued	101	• Scaup (<i>Aythya marila</i>), non-breeding;	Unfavourable declining
		• Eider (<i>Somateria mollissima</i>), non-breeding;	Favourable declining
		• Long-tailed duck (<i>Clangula hyemalis</i>), non-breeding;	Unfavourable declining
		• Common scoter (<i>Melanitta nigra</i>), non-breeding;	Unfavourable declining
		• Velvet scoter (<i>Melanitta fusca</i>), non-breeding;	Favourable maintained
		• Goldeneye (<i>Bucephala clangula</i>), non-breeding;	Unfavourable declining
		• Red-breasted merganser (<i>Mergus serrator</i>), non-breeding;	Favourable declining
		• Oystercatcher (<i>Haematopus ostralegus</i>), non-breeding;	Favourable maintained
		• Ringed plover (<i>Charadrius hiaticula</i>), non-breeding;	Favourable maintained
		• Golden plover (<i>Pluvialis apricaria</i>), non-breeding;	Favourable maintained
		• Grey plover (<i>Pluvialis squatarola</i>), non-breeding;	Favourable declining
		• Lapwing (<i>Vanellus vanellus</i>), non-breeding;	Favourable maintained
		• Knot (<i>Calidris canutus</i>), non-breeding;	Unfavourable declining
		• Dunlin (<i>Calidris alpina alpina</i>), non-breeding;	Favourable declining
		• Bar-tailed godwit (<i>Limosa lapponica</i>), non-breeding;	Favourable declining
		• Curlew (<i>Numenius arquata</i>), non-breeding;	Favourable maintained
• Redshank (<i>Tringa totanus</i>), non-breeding;	Favourable maintained		
• Turnstone (<i>Arenaria interpres</i>), non-breeding.	Favourable maintained		
Firth of Forth Islands^	110	Article 4.1 of the Directive (Annex I Species)	
		Arctic tern (<i>Sterna paradisaea</i>), breeding	Favourable declining
		Roseate tern (<i>Sterna dougallii</i>), breeding	Unfavourable declining
		Common tern (<i>Sterna hirundo</i>), breeding	Favourable maintained
		Sandwich tern (<i>Sterna sandvicensis</i>), breeding	Unfavourable declining
		Article 4.2 of the Directive (Migratory Species)	
		Puffin (<i>Fratercula arctica</i>), breeding	Favourable maintained
		Lesser black-backed gull (<i>Larus fuscus</i>), breeding	Favourable maintained
		Gannet (<i>Morus bassanus</i>), breeding	Favourable maintained
		Shag (<i>Phalacrocorax aristotelis</i>), breeding	Unfavourable recovering
Notes:			
* This is an approximate distance by sea from the proposed development			
^ OSPAR MPA sites			

Table 10.4: SPAs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Firth of Forth Islands^ Continued	110	Article 4.2 of the Directive (Assemblage qualification)	
		Seabird assemblage, breeding including:	Unfavourable declining
		Razorbill (<i>Alca torda</i>);	Favourable maintained
		Puffin (<i>Fratercula arctica</i>);	Favourable maintained
		Fulmar (<i>Fulmarus glacialis</i>);	Favourable maintained
		Herring gull (<i>Larus argentatus</i>);	Favourable maintained
		Lesser black-backed gull (<i>Larus fuscus</i>);	Favourable maintained
		• Gannet (<i>Morus bassanus</i>);	Favourable Maintained
		• Shag (<i>Phalacrocorax aristotelis</i>);	Unfavourable recovering
		• Cormorant (<i>Phalacrocorax carbo</i>);	Favourable declining
		• Kittiwake (<i>Rissa tridactyla</i>);	Unfavourable declining
		• Roseate tern (<i>Sterna dougallii</i>);	Unfavourable declining
		• Common tern (<i>Sterna hirundo</i>);	Favourable maintained
		• Arctic tern (<i>Sterna paradisaea</i>);	Favourable declining
		• Sandwich tern (<i>Sterna sandvicensis</i>);	Unfavourable declining
• Guillemot (<i>Uria aalge</i>).	Favourable maintained		
Notes:			
* This is an approximate distance by sea from the proposed development			
^ OSPAR MPA sites			

Table 10.5: Species foraging distances (based on Thaxter et al., 2012)

Species	Maximum [km]	Mean of Maximum [km]	Global Mean [km]	Confidence
Atlantic Puffin (<i>Fratercula arctica</i>)	200	105.4	4	Low
Common tern (<i>Sterna hirundo</i>)	30	15.2	4.5	Moderate
Eider (<i>Somateria mollissima</i>)	80	80	2.4	Poor
Fulmar (<i>Fulmarus glacialis</i>)	580	400	47.5	Moderate
Great Cormorant (<i>Phalacrocorax carbo</i>)	35	25	5.2	Moderate
Guillemot (<i>Uria aalge</i>)	135	84.2	37.8	Highest
Herring gull (<i>Larus argentatus</i>)	92	61.1	10.5	Moderate
Kittiwake (<i>Rissa tridactyla</i>)	120	60	24.8	Highest
Little tern (<i>Sternula albifrons</i>)	11	6.3	2.1	Low
Razorbill (<i>Alca torda</i>)	95	48.5	23.7	Moderate
Sandwich tern (<i>Sterna sandvicensis</i>)	54	49	11.5	Moderate
Shag (<i>Phalacrocorax aristotelis</i>)	>65			Moderate
Notes:				
Arbitrary confidence levels were assigned to the representative foraging ranges				
'highest' = more than five direct studies				
'moderate' = between two and five direct studies				
'low' = indirect measures or only one direct tracking study available				
'uncertain' = survey-based estimates				
'poor' = few survey estimates or speculative data available				
Where very few direct studies were available, but indirect studies (e.g. razorbill), or survey methods (e.g. little tern and roseate tern) gave greater understanding, we treated these species as special cases where assessment methods and confidence levels were subjectively adjusted				

10.4.3.1 Ythan Estuary, Sands of Forvie and Meikle Loch SPA

Ythan Estuary, Sands of Forvie and Meikle Loch SPA is located north of Aberdeen and comprises the long, narrow estuary of the River Ythan as well as the small, eutrophic, Meikle Loch. At its mouth, the river splits an extensive area of sand dunes with the Forveran Links on the west bank and the Sands of Forvie dune system on the east bank. Extensive mudflats in the upper reaches of the estuary are replaced by coarser gravels with Mussel *Mytilus edulis* beds closer to the sea. The margins of the estuary are varied, with areas of saltmarsh, reedbed and poor fen. The SPA covers an area of 1,016.24 ha (JNCC, 2015j).

The site forms the Forvie National Nature Reserve which is managed for its nature conservation interest under an agreed management plan (JNCC, 2015j).

Meikle Loch is an important roost site for geese, which feed away from the SPA on surrounding farmland in winter. It is a eutrophic loch supporting limited aquatic vegetation. In summer the coastal habitats of the dunes and estuary provide an important breeding site for three species of tern, whilst in winter the estuary holds large numbers of waders, ducks and geese (JNCC, 2015j).

Connectivity between the site and the proposed development is implied, in particular, by the foraging ranges for sandwich tern, pink-footed goose and eider (Table 10.4 and Table 10.5; RPS 2008). Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.3.2 Buchan Ness to Collieston Coast SPA

Buchan Ness to Collieston Coast SPA is a stretch of south-east facing cliff in Aberdeenshire. The 15 km stretch of cliffs, formed of granite, quartzite and other rocks, runs south of Peterhead, broken only by the sandy beach of Cruden Bay. The low, broken cliffs (generally less than 50 m high) show many erosion features such as stacks, arches, caves and blowholes. The varied coastal vegetation on the ledges and the cliff tops includes maritime heath, grassland and brackish flushes. The boundary of the SPA follows the boundaries of Bullers of Buchan Coast SSSI and Collieston to Whinnyfold Coast SSSI, and the seaward extension extends approximately 2 km into the marine environment to include the seabed, water column and surface. The site is important as a nesting area for a number of seabird species (gulls and auks). These birds feed outside the SPA in the nearby waters, as well as more distantly. The SPA covers an area of 5,400.94 ha (JNCC, 2015k).

Connectivity between the site and the proposed development is implied by the foraging ranges for guillemot, kittiwake, fulmar, shag and herring gull (Table 10.4 and Table 10.5). Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.3.3 Loch of Strathbeg SPA

The Loch of Strathbeg is located in Aberdeenshire, inland from Rattray Head. It is a shallow, naturally eutrophic loch with adjoining reedbeds, freshwater marshes, and Alder *Alnus glutinosa* and willow *Salix* spp. *carr.* The calcareous dunes and dune slacks within the site are relatively undisturbed and contain a rich flora. The loch constitutes the largest dune slack pool in the UK (200 ha) and the largest waterbody in the north-east Scottish lowlands. It is separated from the sea by a 0.5 km to 1 km wide dune system. The SPA provides wintering habitat for a number of important wetland bird species, particularly wildfowl (swans, geese and ducks), and is also an important staging area for migratory

wildfowl from Scandinavia and Iceland/Greenland. In summer, coastal parts of the site are an important breeding area for Sandwich Tern *Sterna sandvicensis*, which feed outside the SPA in adjacent marine areas. Almost the entire site is a Royal Society for the Protection of Birds (RSPB) reserve and is managed by them for nature conservation, primarily for the SPA interest. The SPA covers an area of 615.94 ha (JNCC, 2015i).

The SSSI site management document indicates that depending on water levels and tides, the loch is also subject to occasional salt water ingress from the sea. The RSPB (2008) also note that there is some saline intrusion, but the loch is generally freshwater and is the largest sand dune loch in Britain. The RSPB reserve has been in place since 1979, and encompasses 70% of the loch, plus adjacent SSSI wetland and some undesignated improved grassland.

With the possible exception of Sandwich tern, none of the bird species for which this site has been designated have foraging ranges which would indicate connectivity to the area of the proposed development (see Table 10.4 and Table 10.5). Sandwich tern have been recorded as having a maximum foraging distance of 54 km and a mean of all the maximum foraging ranges recorded by different studies of 49 km (Thaxter et al., 2012). However, the global mean, that is the mean foraging range reported for each colony averaged across all colonies, is 11.5 km. The straight line distance between the proposed development area and the SPA is approximately 55 km. On this basis the likelihood of connectivity between sites is considered minimal and therefore the Loch of Strathbeg is not considered further in this assessment. Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.3.4 Troup, Pennan and Lion's Heads SPA

Troup, Pennan and Lion's head SPA is a 9 km stretch of sea cliffs along the Banff and Buchan coast of Aberdeenshire. As well as cliffs, the site also includes adjacent areas of grassland and heath, and several small sand or shingle beaches punctuate the otherwise rocky shore. The cliffs rise to 150 m and support large colonies of breeding seabirds which nest here and feed in the rich waters offshore and outside the SPA. Different parts of the cliffs are used by different species of seabirds according to varying ecological requirements. The site is particularly important for its numbers of gulls and auks. The boundary of the SPA overlaps with the boundary of Gamrie and Pennan coast SSSI and the seaward extension extends approximately 2 km into the marine environment to include the seabed, water column and surface. The SPA covers an area of 3,367.21 ha (JNCC, 2015m and SNH, 2015b).

The distance by sea from the proposed development to this SPA was estimated at 85 km (Table 10.4). The straight line distance is shorter at approximately 61 km. Foraging ranges reported by Thaxter et al. (2012) indicate that there may be some connectivity between this site and the proposed development (Table 10.4 and Table 10.5). In particular, in relation to fulmar, which has a maximum range of 580 km; a mean of all the maximum foraging ranges of 400 km; and, a global mean of 47.5 km (Table 10.5). In addition, kittiwake, herring gull and guillemot foraging ranges also suggest possible connectivity with maximum mean values of around 60 or more km. Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.3.5 Fowlsheugh SPA

Overlooking the North Sea, Fowlsheugh is located 4 km south of Stonehaven on the east coast of Aberdeenshire. The sheer cliffs, between 30 m to 60 m high, are cut mostly in basalt and conglomerate of Old Red Sandstone age. They form a rock face with diverse structure providing ideal nesting sites for seabirds. The cliffs support major numbers of breeding seabirds, especially gulls and auks. The seabirds feed outside the SPA in nearby waters, as well as more distantly in the North Sea. The boundary of the SPA overlaps with the boundaries of Fowlsheugh SSSI. The seaward extension extends 2 km into the marine environment and includes the seabed, water column and surface. The site is owned and managed as a nature reserve by the RSPB. The SPA covers an area of 1,303.54 ha (JNCC, 2015n and SNH, 2015c).

Connectivity between the site and the proposed development is implied by the foraging ranges for guillemot, kittiwake, razorbill, fulmar and herring gull (Table 10.4 and Table 10.5). Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.3.6 Montrose Basin SPA

The Montrose Basin is located on the east coast of Scotland in Angus. It is an enclosed tidal basin fed by the River South Esk and contains areas of mudflat, marsh and agricultural land, and Dun's Dish, a small eutrophic loch 4 km north-west of the Basin. The site boundaries follow those of Montrose Basin (minus 0.3 ha of SSSI at the south-east corner of the Basin) and Dun's Dish SSSIs. It is a good natural example of an estuary, relatively unaffected by development, with high species diversity in the intertidal zone and supporting a large population of wintering waterbirds. The site is important for wintering populations of Iceland/Greenland Pink-footed Goose *Anser brachyrhynchus* and Icelandic Greylag Goose *Anser anser*, along with ducks and waders. The geese feed away from the SPA on surrounding agricultural land during the day. The SPA covers an area of 984.61 ha (JNCC, 2015o and SNH, 2015d).

Most of the Montrose Basin is a Local Nature Reserve, and is managed for its nature conservation interest by the Scottish Wildlife Trust on behalf of Angus Council. SNH encourage sympathetic management of the site through management agreements, the SSSI procedures and input into the management of the Local Nature Reserve (JNCC, 2015o).

The distance by sea from the proposed development to this SPA was estimated at 58 km (Table 10.4). The straight line distance is only slightly shorter at approximately 54 km. With the possible exception of eider, available foraging ranges for those species designated for the SPA indicate that none would suggest connectivity to the area of the proposed development (Table 10.4 and Table 10.5). Eider may travel up to a maximum of 80 km although the global mean is much smaller at 2.4 km and the sample size is small hence confidence in the data is poor (Table 10.5). However, as a precaution the site is included in the ES to capture this potential interaction. Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA .

10.4.3.7 Firth of Tay and Eden Estuary SPA

The Firth of Tay and Eden Estuary SPA is a complex of estuarine and coastal habitats in eastern Scotland stretching for some 35 km from the mouth of the River Earn in the inner Firth of Tay east to Barry Sands on the Angus coast and St Andrews on the Fife Coast. The site includes extensive

invertebrate-rich intertidal flats and areas of reedbed, saltmarsh and sand dune. The SPA is contained within the following SSSIs: Inner Tay Estuary, Monifieth Bay, Barry Links, Tayport-Tentsmuir Coast and Eden Estuary. For much of its length the main channel of the estuary lies close to the southern shore and the most extensive intertidal flats are on the north side, west of Dundee. In Monifieth Bay, to the east of Dundee, the substrate becomes sandier and there are also Mussel *Mytilus edulis* beds. The site is of importance in summer for breeding terns and Marsh Harrier *Circus aeruginosus*, whilst in the migration periods and in winter the estuary holds major concentrations of waterbirds, especially waders, sea-ducks and geese. Sea-ducks also feed, loaf and roost outside the SPA in the open waters of the Firth. As noted previously for the SAC, aggregate removal occurs in the Firth but, this is outwith the SPA and is not considered to have an adverse effect on the integrity of the site. The SPA covers an area of 6,923.29 ha (JNCC, 2015p and SNH, 2015e).

The distance by sea from the proposed development to this SPA was estimated at 86 km (Table 10.4). The straight line distance is only slightly shorter at approximately 82 km. Eider are an example of a bird species at this site, which suggests possible connectivity to the area of the proposed development (Table 10.4 and Table 10.5). Eider may travel up to a maximum of 80 km although the global mean is much smaller at 2.4 km and the sample size is small, hence confidence in the data is poor (Table 10.5). A range of other non-breeding migrants are listed for the SPA (Table 10.4). The SPA was not listed by SNH in the Scoping Opinion (refer to ES Appendix 1-D). The site has been screened in for the HRA (Volume 4: HRA) and relevant bird species such as eider have been assessed in Chapter 14: Marine Ornithology.

10.4.3.8 Firth of Forth SPA

This is a complex estuarine site, stretching for over 100 km from the River Forth at Stirling eastwards past Edinburgh and along the coasts of Fife and East Lothian to a wide estuary mouth. A wide range of coastal and intertidal habitats is found within the site, including saltmarshes, dune systems, maritime grasslands, heath and fen, cliff slopes, shingle and brackish lagoons. Extensive mud-flats occur particularly in the Inner Firth supporting a rich invertebrate fauna, with Eelgrass *Zostera* spp. growing on the main mud-flats, both features providing important food sources for the large numbers of migrating and wintering waterbirds that depend on the estuary. In the Outer Firth, the shoreline diversifies, with sandy shores, some rocky outcrops, mussel beds and some artificial sea walls. The North Berwick coast includes cliffs and dune grassland, with extensive dune systems at Aberlady. The Firth is of major importance for a rich assemblage of waterbirds in the migration periods and through the winter, including divers, sea-ducks, geese, other ducks, waders and terns. Some of these species, notably the sea-ducks and divers, also feed, loaf and roost outside the SPA in the open waters of the estuary. The SPA covers an area of 6,313.72 ha (JNCC, 2015q and SNH, 2001).

As indicated in the UK SPA Data Form, while the major factor potentially affecting the site is coastal industrial development, such development is subject to detailed planning control, ensuring that the site is not significantly affected. Oil and other industrial developments concentrated along the shoreline do pose a threat, however rigorous emergency contingency plans are in place to minimise the impact of any incident (JNCC, 2015q).

The distance by sea from the proposed development to this SPA was estimated at 101 km (Table 10.4). Some interaction between the proposed development and the non-breeding waterfowl

assemblage has been identified, in particular with regard to eider. The site has been screened in for Volume 4: HRA and eider have been assessed in the Chapter 14: Marine Ornithology.

10.4.3.9 Forth Islands SPA

The Firth of Forth Islands are located in or near to the Firth of Forth on the east coast of central Scotland. The SPA comprises a number of separate islands or island groups, principally Inchmickery (together with the nearby Cow and Calves) off Edinburgh, Fidra, Lamb and Craigleith together with the Bass Rock off North Berwick, and the much larger Isle of May in the outer part of the Firth. The site also includes other small islands. The islands support important numbers of a range of breeding seabirds, in particular terns, auks and gulls. The colony of gannets *Morus bassanus* is the largest on the east coast of the UK. The seabirds feed outside the SPA in nearby waters, as well as more distantly in the North Sea (JNCC, 2015r).

According to the UK SPA Data Form there are few threats to the interest of the site. The Isle of May is a National Nature Reserve managed for its nature conservation interest by SNH. Fidra, The Lamb and Inchmickery are managed for their nature conservation interest by the RSPB while Long Craig Island is managed by the Fife Bird Club and the Scottish Wildlife Trust. The tern population has declined, most likely because of the expansion in gull numbers combined with the natural mobility of tern colonies. SNH and RSPB are undertaking management initiatives to encourage a recovery in the tern population. The Scottish Seabird Centre has raised awareness of the colonies on the East Lothian Islands (JNCC, 2015r).

The distance by sea from the proposed development to this SPA was estimated at 110 km (Table 10.3). Foraging ranges for some of those species designated for the SPA suggest potential connectivity with the area of the proposed development (Table 10.4 and Table 10.5). These include the Article 4.2 migratory species Puffin and Gannet as well as Fulmar, which form part of the broader seabird assemblage. Relevant assessments are available in the Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.3.10 Draft Special Protection Areas (dSPAs)

A suite of marine dSPAs in Scottish waters is currently being considered by the Scottish government. It was recognised that the suite of SPAs on land in Scotland is well established, but that further work was needed to complete a network at sea. The UK government has committed to identifying a network of SPAs in the marine environment, and having them substantially classified, by the end of 2015. Information was made public in 2014 but its release did not constitute the initiation of a consultation stage.

SNH (2014b) have stated the following with regard to dSPAs:

"It is the Scottish Government's intention that Habitats Regulations Appraisal and Environmental Impact Assessment arrangements should be undertaken for sites in the suite from the date at which Ministerial approval is granted for the sites to go to consultation. The existing suite is an indicative list, and until specific Ministerial approval has been granted there is no certainty that they will all go forward to become pSPAs."

The boundaries of the four dSPAs are presented in Figure 10.1. SNH (2014b) have selected the qualifying bird species for each dSPA (Table 10.6). These draft designations will not, at this stage, be considered further within either the HRA or ES until ministerial approval is obtained.

Table 10.6: dSPAs considered within the assessment

Site Name	Distance [km]*	Qualifying Bird Species
Ythan Estuary and Sands of Forvie	2.5	Article 4.1 of the Directive (Annex I Species)
		Sandwich tern (<i>Sterna sandvicensis</i>)
		Little tern (<i>Sternula albifrons</i>)
Moray Firth	118	Article 4.1 of the Directive (Annex I Species)
		Great northern diver (<i>Gavia immer</i>)
		Red-throated diver (<i>Gavia stellata</i>)
		Slavonian grebe (<i>Podiceps auritus</i>)
		Article 4.2 of the Directive (Migratory Species)
		Greater scaup (<i>Aythya marila</i>)
		Eider (<i>Somateria mollissima</i>)
		Long-tailed duck (<i>Clangula hyemalis</i>)
		Common scoter (<i>Melanitta nigra</i>)
		Velvet scoter (<i>Melanitta fusca</i>)
		Common goldeneye (<i>Bucephala clangula</i>)
Red-breasted merganser (<i>Mergus serrator</i>)		
European shag (<i>Phalacrocorax aristotelis</i>)		
Outer Firth of Forth and Tay Bay Complex	70	Article 4.1 of the Directive (Annex I Species)
		Red-throated diver (<i>Gavia stellata</i>)
		Slavonian grebe (<i>Podiceps auritus</i>)
		Little gull (<i>Hydrocoloeus minutes</i>)
		Common tern (<i>Sterna hirundo</i>)
		Arctic tern (<i>Sterna paradisaea</i>)
		Article 4.2 of the Directive (Migratory Species)
		Eider (<i>Somateria mollissima</i>)
		Long-tailed duck (<i>Clangula hyemalis</i>)
		Common scoter (<i>Melanitta nigra</i>)
		Velvet scoter (<i>Melanitta fusca</i>)
		Common goldeneye (<i>Bucephala clangula</i>)
		Red-breasted merganser (<i>Mergus serrator</i>)
		Northern gannet (<i>Morus bassanus</i>)
		Manx shearwater (<i>Puffinus puffinus</i>)
European shag (<i>Phalacrocorax aristotelis</i>)		
Black-legged kittiwake (<i>Rissa tridactyla</i>)		
Common guillemot (<i>Uria aalge</i>)		
Note:		
* This is an approximate distance by sea from the proposed development		

Table 10.6: dSPAs considered within the assessment continued

Site Name	Distance [km]*	Qualifying Bird Species
Outer Firth of Forth and Tay Bay Complex Continued	70	Razorbill (<i>Alca torda</i>) Atlantic puffin (<i>Fratercula arctica</i>) Black-headed gull (<i>Chroicocephalus ridibundus</i>) Common gull (<i>Larus canus</i>) Herring gull (<i>Larus argentatus</i>)
Pentland Firth and Scapa Flow	185	Article 4.1 of the Directive (Annex I Species)
		Great northern diver (<i>Gavia immer</i>)
		Red-throated diver (<i>Gavia stellata</i>)
		Black-throated diver (<i>Gavia arctica</i>)
		Slavonian grebe (<i>Podiceps auritus</i>)
		Arctic tern (<i>Sterna paradisaea</i>)
		Article 4.2 of the Directive (Migratory Species)
		European shag (<i>Phalacrocorax aristotelis</i>) Common guillemot (<i>Uria aalge</i>) Common eider (<i>Somateria mollissima</i>) Long-tailed duck (<i>Clangula hyemalis</i>) Goldeneye (<i>Bucephala clangula</i>) Red-breasted merganser (<i>Mergus serrator</i>)
Note: * This is an approximate distance by sea from the proposed development		

10.4.4 International Designations: Ramsar sites

Four Ramsar sites were considered within this assessment (Table 10.7).

Two of the four sites listed in Table 10.7 are not considered further in this section because they are already considered under the equivalent SPA designations (the areas match and the identified features are also designated for the SPA) are the Loch of Strathbeg, and the Firth of Tay and Eden Estuary. As part of a precautionary approach Montrose Basin is included because of the presence of eider. However, it should be noted that although eider are listed on the information sheet on Ramsar Wetlands (RIS) for the site it is only under the heading ‘noteworthy fauna’ and as such does not in and of itself fulfil any of the designation criteria. In addition, confidence in the foraging range data reported by Thaxter et al. (2012) for the species is poor.

Table 10.7: Ramsar sites considered within the assessment

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Ythan Estuary and Meikle Loch	20	Ramsar criterion 5 (Assemblages of international importance)	
		Waterfowl assemblage, non-breeding	Favourable, maintained
		Ramsar criterion 6 (species/populations at levels of international importance)	
		Sandwich tern (<i>Sterna sandvicensis</i>), breeding Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained Favourable, maintained
Loch of Strathbeg	60	Ramsar criterion 1 (Wetland of international importance)	
		The loch constitutes the largest dune slack pool in Britain and the largest water body in the north-east Scottish lowlands and is one of very few naturally eutrophic lochs of the size in the region.	Unfavourable, no change
		Ramsar criterion 5 (Assemblages of international importance)	
		Waterfowl assemblage, non-breeding	Favourable, maintained
		Ramsar criterion 6 (species/populations at levels of international importance)	
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding Greylag goose (<i>Anser anser</i>), non-breeding Whooper swan (<i>Cygnus cygnus</i>), non-breeding	Favourable, maintained Unfavourable, no change Favourable, maintained
Montrose Basin	58	Ramsar criterion 1 (Wetland of international importance)	
		A particularly good example of an estuary, being relatively unaffected by land-claim, industrial development or pollution.	Favourable, maintained
		Ramsar criterion 5 (Assemblages of international importance)	
		Waterfowl assemblage, non-breeding	Favourable, maintained
		Ramsar criterion 6 (species/populations at levels of international importance)	
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding Greylag goose (<i>Anser anser</i>), non-breeding Redshank (<i>Tringa totanus</i>), non-breeding	Favourable, maintained Unfavourable, no change Favourable, maintained
Firth of Tay and Eden Estuary	86	Ramsar criterion 5 (Assemblages of international importance)	
		Waterfowl assemblage, non-breeding	Favourable, maintained
		Ramsar criterion 6 (species/populations at levels of international importance)	
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding Greylag goose (<i>Anser anser</i>), non-breeding Bar-tailed godwit (<i>Limosa lapponica</i>), non-breeding	Favourable, recovered Favourable, declining Favourable, maintained
		Redshank (<i>Tringa totanus</i>), non-breeding	Favourable, maintained
Note: * This is an approximate distance by sea from the proposed development			

10.4.4.1 Ythan Estuary and Meikle Loch Ramsar site

This site comprises the long, narrow estuary of the River Ythan and the eutrophic Meikle Loch. Extensive mudflats in the upper reaches of the estuary are replaced by coarser gravels with mussel beds closer to the sea. The margins of the estuary are varied, with areas of saltmarsh, reedbeds and poor-fen. Meikle Loch is an important roost site for geese which feed on surrounding farmland in winter. It is a eutrophic loch supporting limited aquatic vegetation. It is joined by a burn to the smaller Little Loch (JNCC, 2015s). The site covers an area of 314.17 ha.

Connectivity between the site and the proposed development is suggested, in particular, by the foraging ranges for sandwich tern and pink-footed goose (Table 10.7 and Table 10.5). Eider, as for the Montrose Basin Ramsar site (see Section 10.4.4.2), is listed as 'Noteworthy fauna' for the site but do not occur at levels of international importance (Criteria 6). Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.4.2 Montrose Basin Ramsar site

This site is the enclosed estuary of the South Esk containing areas of mudflat, marsh and agricultural land, and Dun's Dish, a small eutrophic freshwater loch. It is a good natural example of an estuary, relatively undisturbed by development, a high species diversity in the intertidal zone and supporting a large population of wintering waterfowl. The site is also important internationally for wintering populations of pink-footed goose *Anser brachyrhynchus*, greylag goose *Anser anser* and common redshank *Tringa tetanus* (JNCC, 2015t). The site covers an area of 984.62 ha.

The distance by sea from the proposed development to this Ramsar site was estimated at 58 km (Table 10.7). The straight line distance is only slightly shorter at approximately 54 km. With the possible exception of eider, available foraging ranges for those species designated for the Ramsar site indicate that none would suggest connectivity to the area of the proposed development (Table 10.7 and Table 10.5). Eider may travel up to a maximum of 80 km although the global mean is much smaller at 2.4 km and the sample size is small, hence confidence in the data is poor (Table 10.5). However, as a precaution the site is included in the ES to capture this potential interaction. Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.5 **National Designations: Sites of Special Scientific Interest (SSSI)**

SSSIs are the foundation of nature conservation in the UK. Nineteen sites have been considered in this chapter (Table 10.8).and information on these is presented in this section.

Table 10.8: SSSIs considered within the assessment

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Nigg Bay	0	Quaternary of Scotland	Favourable, recovered
Fowlsheugh	26	Seabird colony, breeding	Favourable, maintained
		Kittiwake (<i>Rissa tridactyla</i>), breeding	Favourable, maintained
		Guillemot (<i>Uria aalge</i>), breeding	Favourable, maintained
		Razorbill (<i>Alca torda</i>), breeding	Favourable, maintained
		Fulmar (<i>Fulmarus glacialis</i>), breeding	-
		Puffin (<i>Fratercula arctica</i>), breeding	-
St Cyrus and Kinnaber Links	47	Saltmarsh	Partially destroyed
		Sand dunes	Unfavourable, recovering
		Shingle	-
		Breeding bird assemblage	Favourable, maintained
		Vascular plant assemblage	Favourable, maintained
		Moths	Favourable, maintained
		Small blue (<i>Cupido minimus</i>)	Favourable, maintained
Lowland neutral grassland	-		
Montrose Basin	58	Mudflats	Favourable, maintained
		Saltmarsh	Favourable, maintained
		Transition saltmarsh	Favourable, maintained
		Oystercatcher (<i>Haematopus ostralegus</i>), non-breeding	Favourable, maintained
		Wigeon (<i>Anas penelope</i>), non-breeding	Favourable, maintained
		Eider (<i>Somateria mollissima</i>), breeding	Favourable, maintained
		Eider (<i>Somateria mollissima</i>), non-breeding	Favourable, maintained
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Redshank (<i>Tringa totanus</i>), non-breeding	Favourable, maintained
		Mute swan (<i>Cygnus olor</i>), non-breeding	Favourable, maintained
		Knot (<i>Calidris canutus</i>), non-breeding	Favourable, Maintained
		Greylag goose (<i>Anser anser</i>), non-breeding	Unfavourable, no change
Quaternary of Scotland	Favourable, maintained		
Rickle Craig - Scurdie Ness	55	Saltmarsh	Favourable, maintained
		Maritime cliff	Favourable, maintained
		Mollusc assemblage	Favourable, maintained
		Mineralogy of Scotland	Favourable, maintained
		Old Red Sandstone Igneous	Favourable, maintained
Notes:			
* This is an approximate distance by sea from the proposed development			
† Only notified bird species listed here as other features have no connectivity			

Table 10.8: SSSIs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Whiting Ness - Ethie Haven	65	Purple sandpiper (<i>Calidris maritima</i>), non-breeding	Favourable, declining
		Turnstone (<i>Arenaria interpres</i>), non-breeding	Favourable, maintained
		Shag (<i>Phalacrocorax aristotelis</i>), breeding	Favourable, maintained
		Kittiwake (<i>Rissa tridactyla</i>), breeding	Favourable, maintained
		Fulmar (<i>Fulmarus glacialis</i>), breeding	Favourable, maintained
		Puffin (<i>Fratercula arctica</i>), breeding	-
		Small blue (<i>Cupido minimus</i>)	Favourable, maintained
		Lowland neutral grassland	Favourable, declining
		Maritime cliff	Unfavourable, declining
Old Red Sandstone Igneous	Favourable, maintained		
Non-marine Devonian	Favourable, maintained		
Monifieth Bay	95	Sanderling (<i>Calidris alba</i>), non-breeding	Favourable, maintained
Inner Tay Estuary	105	Water rail (<i>Rallus aquaticus</i>), breeding	Favourable, maintained
		Bearded tit (<i>Panurus biarmicus</i>), breeding	Favourable, maintained
		Marsh harrier (<i>Circus aeruginosus</i>), breeding	Favourable, maintained
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Cormorant (<i>Phalacrocorax carbo</i>), non-breeding	Favourable, recovered
		Goldeneye (<i>Bucephala clangula</i>), non-breeding	Unfavourable, declining
		Greylag goose (<i>Anser anser</i>), non-breeding	Unfavourable, declining
		Breeding bird assemblage	Favourable, maintained
		Transition saltmarsh	Favourable, maintained
Saltmarsh	Unfavourable, declining		
Tayport - Tentsmuir Coast	91	Mudflats	Favourable maintained
		Sand dunes	Unfavourable, recovering
		Red-breasted merganser (<i>Mergus serrator</i>), non-breeding	Favourable, maintained
		Long-tailed duck (<i>Clangula hyemalis</i>), non-breeding	Unfavourable, declining
		Goosander (<i>Mergus merganser</i>), non-breeding	Favourable, maintained
		Eider (<i>Somateria mollissima</i>), non-breeding	Favourable, maintained
		Bar-tailed godwit (<i>Limosa lapponica</i>), non-breeding	Favourable, maintained
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Common scoter (<i>Melanitta nigra</i>), non-breeding	Unfavourable, no change
Harbour/common seal (<i>Phoca vitulina</i>)	Unfavourable, declining		

Notes:

* This is an approximate distance by sea from the proposed development

† Only notified bird species listed here as other features have no connectivity

Table 10.8: SSSIs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Tayport - Tentsmuir Coast Continued	91	Beetle assemblage Vascular plant assemblage Coastal Geomorphology of Scotland	Favourable, maintained Favourable, recovered Favourable, maintained
Eden Estuary	96	Mudflats Saltmarsh Sand dunes Scrub Greylag goose (<i>Anser anser</i>), non-breeding Ringed plover (<i>Charadrius hiaticula</i>), non-breeding Oystercatcher (<i>Haematopus ostralegus</i>), non-breeding Scaup (<i>Aythya marila</i>), non-breeding Red-breasted merganser (<i>Mergus serrator</i>), non-breeding Eider (<i>Somateria mollissima</i>), non-breeding Black-tailed godwit (<i>Limosa limosa</i>), non-breeding Velvet scoter (<i>Melanitta fusca</i>), non-breeding Grey plover (<i>Pluvialis squatarola</i>), non-breeding Bar-tailed godwit (<i>Limosa lapponica</i>), non-breeding Common scoter (<i>Melanitta nigra</i>), non-breeding Redshank (<i>Tringa totanus</i>), non-breeding Shelduck (<i>Tadorna tadorna</i>), non-breeding	Favourable, maintained Unfavourable, no change Unfavourable, no change Favourable, maintained Favourable, maintained Unfavourable, declining Favourable, recovered Unfavourable, declining Favourable, maintained Favourable, maintained Unfavourable, declining Favourable, maintained Favourable, recovered Favourable, declining Favourable, maintained Unfavourable, declining
Firth of Forth†	101	Eider (<i>Somateria mollissima</i>), breeding Ringed plover (<i>Charadrius hiaticula</i>), breeding Shelduck (<i>Tadorna tadorna</i>), breeding Bar-tailed godwit (<i>Limosa lapponica</i>), non-breeding Common scoter (<i>Melanitta nigra</i>), non-breeding Cormorant (<i>Phalacrocorax carbo</i>), non-breeding Curlew (<i>Numenius arquata</i>), non-breeding Dunlin (<i>Calidris alpina alpina</i>), non-breeding Eider (<i>Somateria mollissima</i>), non-breeding Golden plover (<i>Pluvialis apricaria</i>), non-breeding Goldeneye (<i>Bucephala clangula</i>), non-breeding Great crested grebe (<i>Podiceps cristatus</i>), non-breeding	Unfavourable, no change Unfavourable, declining Favourable, maintained Favourable, declining Unfavourable, declining Favourable, maintained Favourable, maintained Favourable, declining Favourable, declining Favourable, maintained Unfavourable, declining Unfavourable, declining
Notes: * This is an approximate distance by sea from the proposed development † Only notified bird species listed here as other features have no connectivity			

Table 10.8: SSSIs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Firth of Forth† Continued	101	Grey plover (<i>Pluvialis squatarola</i>), non-breeding	Favourable, declining
		Knot (<i>Calidris canutus</i>), non-breeding	Unfavourable, declining
		Lapwing (<i>Vanellus vanellus</i>), non-breeding	Not assessed
		Long-tailed duck (<i>Clangula hyemalis</i>), non-breeding	Unfavourable, declining
		Mallard (<i>Anas platyrhynchos</i>), non-breeding	Not assessed
		Oystercatcher (<i>Haematopus ostralegus</i>), non-breeding	Favourable, maintained
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Red-breasted merganser (<i>Mergus serrator</i>), non-breeding	Favourable, declining
		Redshank (<i>Tringa totanus</i>), non-breeding	Favourable, maintained
		Red-throated diver (<i>Gavia stellata</i>), non-breeding	Favourable, maintained
		Ringed plover (<i>Charadrius hiaticula</i>), non-breeding	Favourable, maintained
		Sandwich tern (<i>Sterna sandvicensis</i>), passage	Not assessed
		Scaup (<i>Aythya marila</i>), non-breeding	Unfavourable, declining
		Shelduck (<i>Tadorna tadorna</i>), non-breeding	Favourable, declining
Slavonian grebe (<i>Podiceps auritus</i>), non-breeding	Favourable, declining		
Turnstone (<i>Arenaria interpres</i>), non-breeding	Favourable, maintained		
Velvet scoter (<i>Melanitta fusca</i>), non-breeding	Favourable, maintained		
Wigeon (<i>Anas penelope</i>), non-breeding	Not assessed		
Isle of May	110	Maritime cliff	Favourable, maintained
		Grey seal (<i>Halichoerus grypus</i>)	Favourable, maintained
		Eider (<i>Somateria mollissima</i>), breeding	Favourable, maintained
		Purple sandpiper (<i>Calidris maritima</i>), non-breeding	Unfavourable, declining
		Turnstone (<i>Arenaria interpres</i>), non-breeding	Unfavourable, declining
		Puffin (<i>Fratercula arctica</i>), breeding	Favourable, declining
		Guillemot (<i>Uria aalge</i>), breeding	Unfavourable, declining
		Kittiwake (<i>Rissa tridactyla</i>), breeding	Unfavourable, declining
Seabird colony, breeding	Favourable, maintained		
Shag (<i>Phalacrocorax aristotelis</i>), breeding	Unfavourable, recovering		
Sands of Forvie and Ythan Estuary	20	Estuary	-
		Saltmarsh	Favourable, declining
		Sand dunes	Unfavourable, declining
		Breeding bird assemblage	Favourable, maintained
Notes:			
* This is an approximate distance by sea from the proposed development			
† Only notified bird species listed here as other features have no connectivity			

Table 10.8: SSSIs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Sands of Forvie and Ythan Estuary Continued	20	Arctic tern (<i>Sterna paradisaea</i>), breeding	Favourable, maintained
		Common tern (<i>Sterna hirundo</i>), breeding	Unfavourable, declining
		Little tern (<i>Sternula albifrons</i>), breeding	-
		Sandwich tern (<i>Sterna sandvicensis</i>), breeding	Favourable, maintained
		Eider (<i>Somateria mollissima</i>), breeding	Unfavourable, declining
		Eider (<i>Somateria mollissima</i>), non-breeding	Favourable, maintained
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Vascular plant assemblage	-
Collieston to Whinnyfold Coast	25	Maritime cliff	Favourable, maintained
		Sea wormwood (<i>Seriphidium maritimum</i>)	Favourable, maintained
		Seabird colony, breeding	Favourable, maintained
		Fulmar (<i>Fulmarus glacialis</i>), breeding	Unfavourable, declining
		Kittiwake (<i>Rissa tridactyla</i>), breeding	Unfavourable, no change
		Razorbill (<i>Alca torda</i>), breeding	Favourable, maintained
		Guillemot (<i>Uria aalge</i>), breeding	Favourable, maintained
		Dalradian	Favourable, maintained
Meikle Loch and Kippet Hills	27	Greylag goose (<i>Anser anser</i>), non-breeding	Unfavourable, no change
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
		Quaternary of Scotland	Unfavourable, declining
Bullers of Buchan Coast	33	Maritime cliff	Favourable, maintained
		Seabird colony, breeding	Favourable, maintained
		Shag (<i>Phalacrocorax aristotelis</i>), breeding	Favourable, maintained
		Guillemot (<i>Uria aalge</i>), breeding	Unfavourable, declining
		Kittiwake (<i>Rissa tridactyla</i>), breeding	Unfavourable, no change
Loch of Strathbeg	60	Coastal Geomorphology of Scotland	Favourable, maintained
		Saltmarsh	Favourable, maintained
		Sand dunes	Unfavourable, declining
		Open water transition fen	Unfavourable, declining
		Fen meadow	Unfavourable, declining
		Eutrophic loch	Unfavourable, no change
		Breeding bird assemblage	Favourable, maintained
		Pink-footed goose (<i>Anser brachyrhynchus</i>), non-breeding	Favourable, maintained
Goldeneye (<i>Bucephala clangula</i>), non-breeding	Favourable, maintained		
Notes:			
* This is an approximate distance by sea from the proposed development			
† Only notified bird species listed here as other features have no connectivity			

Table 10.8: SSSIs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Loch of Strathbeg Continued	60	Greylag goose (<i>Anser anser</i>), non-breeding Whooper swan (<i>Cygnus cygnus</i>), non-breeding Coastal Geomorphology of Scotland	Unfavourable, no change Favourable, maintained Favourable, maintained
Rosehearty to Fraserburgh Coast	75	Eider (<i>Somateria mollissima</i>), non-breeding Purple sandpiper (<i>Calidris maritima</i>), non-breeding Turnstone (<i>Arenaria interpres</i>), non-breeding Curlew (<i>Numenius arquata</i>), non-breeding Dalradian	Unfavourable, no change Unfavourable, declining Unfavourable, declining Unfavourable, declining Unfavourable, no change
Gamrie and Pennan Coast	87	Seabird colony, breeding Kittiwake (<i>Rissa tridactyla</i>), breeding Guillemot (<i>Uria aalge</i>), breeding Razorbill (<i>Alca torda</i>), breeding Puffin (<i>Fratercula arctica</i>), breeding Fulmar (<i>Fulmarus glacialis</i>), breeding Gannet (<i>Morus bassanus</i>), breeding Maritime cliff Dalradian	Favourable, declining Unfavourable, no change Favourable, declining Favourable, declining - - - Favourable, Maintained Favourable, Maintained
Cullen to Stake Ness Coast	112	Shingle Saltmarsh Springs (including flushes) Lowland dry heath Quaternary of Scotland Dalradian	Favourable, maintained Favourable, maintained - Unfavourable, declining Unfavourable, no change Favourable, maintained
Notes:			
* This is an approximate distance by sea from the proposed development			
† Only notified bird species listed here as other features have no connectivity			

10.4.5.1 Nigg Bay SSSI

The geological notified natural feature for the Nigg Bay SSSI is 'Quaternary of Scotland' (Table 10.8). Nigg Bay is a classic locality for Quaternary stratigraphy in north-east Scotland, illustrating several of the characteristic glacial deposits of the area (SNH, 2015). Since the late 19th century, the Nigg Bay section has been recognised as a key reference site for interpreting the glacial history and ice movement patterns in north-east Scotland (SNH, 2015). The site covers an area of 4.72 ha. (SNH, 2015f) and overlaps with the LNCS Balnagask to Cove. The area of the SSSI includes both the cliff section and an area of the intertidal down to mean low water springs (MLWS).

SNH's Sitelink website shows that the site was last assessed on 4 March 2014 and was found to be 'Favourable Recovered' (http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=1224); however the site management document has not been updated to reflect this latest assessment, and the information presented in this section is taken from the most recent publically available version of the site management document (9 May 2011). A local Biodiversity Action Plan was prepared for the whole Nigg area with SNH aiming to carry out site survey, monitoring and research, to increase knowledge

and understanding of the site and its natural features. It is also noted in the management document that there has been little or no active management of the site.

As presented in the site management document, the unfavourable recovering assessment was made in part because the feature was obscured by tipping that was carried out by previous coastal protection measures undertaken in 1984. These tipping works have created a platform along the extent of the cliffs which has effectively halted erosion of the cliff face and also enabled vegetation to have grown, which has covered the deposits.

A report on managing coastal erosion in Aberdeen by Halcrow Crouch (1999) recommended that there be no active intervention at Nigg Bay, thereby allowing coastal processes to continue to act on the beach and the cliff and resulting in the SSSI deposits being re-exposed in the longer term. An inspection by SNH in 2010 confirmed that coastal erosion is breaking down the platform and identified that it is considered likely that the southern section of the SSSI will be re-exposed within a few years.

As detailed in Chapter 3: Description of the Development, the proposed development will include capital dredging, land reclamation and construction of breakwaters, all of which have the potential to alter the hydrodynamic and sedimentary regime. In addition, there is the potential for direct disturbance of the site during temporary construction works.

SNH (2015f) set two management objectives for the Nigg Bay SSSI (as detailed in the site management document):

- Maintain the visibility of the exposures. Vegetation growth has obscured some of the exposures. The vegetation stabilises the slope and is relatively easy to clear, so SNH recommends that it only needs to be removed if suitable research projects arise. It is noted that SNH will continue to monitor the extent of vegetation and may seek a clearing programme if cover increases and reduces the extent of the exposures; and
- Maintain access to the site and to the exposures.

The specific issue is how the proposed development could change coastal erosion processes, and therefore the stability, survival and accessibility of the coastal cliff exposures. It is not considered that the proposed development will adversely impact directly upon the first management objective as there will be no direct disturbance of the cliff face. Chapter 9: Ground Conditions and Contamination indicates that both the glacial till and bedrock at this location provide stable foundations for the proposed work will protect the cliff from further destabilisation and help to protect the interest feature of the SSSI from significant future erosion. As demonstrated in the ES Appendix 6-B: Hydrodynamic Modelling and Coastal Processes Assessment, the construction of the breakwaters will significantly reduce wave heights within Nigg Bay. The wave energy acting upon the beach in front of the cliff will, therefore, be less likely to erode either the existing or proposed beach profile, thus providing additional protection to the SSSI.

The sediment transport regime outside the development area will experience minimal changes from the development due to the sediment transport pathways remaining unaltered. Within the development area, there will be changes due to the effects on the hydrodynamic regime. Conditions within the harbour will be calmer as large eddy currents will no longer form within the bay, due to the breakwater arms blocking the current and wave action therefore producing lower current speeds. As a result of

weak wave action in the harbour, fine sediments brought into the harbour from local streams and washed off from the coast would likely be deposited in the harbour.

In broad terms coastal erosion is seen as beneficial to the SSSI as it helps to maintain the visibility of exposures (SNH, 2015f). However, excessive erosion will destabilise the cliff with implications for the SSSI and the road. Sediment deposition and erosion patterns in Nigg Bay will be affected by the development. Under the baseline condition, areas of deposition and erosion can be seen, as a result of continuous seabed rework by the actions of waves and currents. However, with the development in place, there would be very little movement of sediment within the harbour due to reduced wave action and current; and this is likely to stabilise the cliff.

It is recognised that it is a delicate balance to maintain erosion of the SSSI so that the interest feature will continue to be exposed, and manage the significant erosion which has been observed at the site in recent years. If SNH deem it necessary and beneficial to the site, AHB will develop suitable mitigation (in collaboration with SNH) to enable the management objectives of the site to be met. This may include undertaking regular inspections of the site, and vegetation clearance work to help maintain the visibility of the exposures (as has previously been undertaken at the site). A collaborative approach in this regard would need to be agreed.

In relation to maintaining access, the security fencing around the development will not preclude access to the SSSI area, so access will be maintained.

Potential connectivity between the site and the proposed development is clearly indicated. A full assessment is provided in Chapter 6: Marine Physical Environment and Chapter 9: Ground Conditions and Contamination.

10.4.5.2 Fowlsheugh SSSI

The site has the largest colony of breeding seabirds in the north-east of Scotland and one of the largest colonies in mainland Britain. The sheer cliffs, between 30 m and 60 m high which are cut mostly in basalt and conglomerate of Old Red Sandstone age, form a rock face with innumerable holes and ledges, and provides ideal sites for cliff nesting seabirds. The SSSI covers an area of 10.2 ha. (SNH, 2015f). The Notified Natural Features are listed in Table 10.8.

The site management document cites that the seabird populations, particularly their breeding success, are likely to be affected by external factors, such as food availability, and marine pollution, especially oil spills (SNH, 2015f).

Connectivity between the site and the proposed development is implied by the foraging ranges for kittiwake, guillemot, razorbill, fulmar and puffin (Table 10.8 and Table 10.5). Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.5.3 St Cyrus and Kinnaber Links SSSI

St Cyrus and Kinnaber Links SSSI is a coastal dune site lying approximately 3 miles north of Montrose on the Aberdeenshire coast, forming part of the Montrose Bay. The varied site consists of sand dunes, shingle, foreshore, river estuary, saltmarsh and cliffs composed of basalts and sites of Old Red

Sandstone age. The site is divided by the River North Esk, with St Cyrus to the north and Kinnaber to the south. The diversity of habitats on either side of the river, associated with the dunes, foreshore and river estuary, is complemented by both fossil and active sea cliffs at St Cyrus, and by sand-covered shingle on Kinnaber Links. St Cyrus, sheltered beneath base rich cliffs, is notable as one of the richest and most important botanical sites on the coast of north-east Scotland with a number of species at the northern limit of their range in Britain. It also supports rich assemblages of invertebrates and breeding birds. The dune systems of St Cyrus are highly dynamic, due in part to the influence of the changing course of the River North Esk combined with coastal erosional and depositional processes. The dunes and saltmarshes have been affected by natural changes in the dynamic coastal system. At St Cyrus a new foredune was created at the place where the sea entered a former river channel, thus preventing winter flooding, and reducing the saltmarsh in the channel to a narrow strip. In contrast, the Kinnaber saltmarsh, around a tidal creek and small lagoon, is largely intact. The SSSI covers an area of 304.91 ha. (SNH, 2015f). The Notified Natural Features are listed in Table 10.8.

The breeding bird assemblage is comprised of about 60 regular breeding species and includes fulmar, shelduck, eider, curlew, redshank, ringed plover and oystercatcher. The site is about 47 km from the proposed development and as such some connectivity with the proposed development site is possible in respect of, for example, fulmar and eider (Table 10.8 and Table 10.5). Relevant assessments are available in the Chapter 14: Marine Ornithology. No connectivity between the notified habitats and the proposed development is suggested given the relatively large intervening distance.

10.4.5.4 Montrose Basin SSSI

Montrose Basin SSSI is the large, almost circular, estuarine basin of the River South Esk. It was selected as an SSSI for its coastal habitats (saltmarsh and extensive mudflats at low tide, brackish and freshwater habitats), and also the bird-life that these support, including a nationally important population of breeding eiders (Table 10.8). The site was deemed to be of international importance for its wetland habitats and wintering birds and has been designated as an SPA and a Ramsar wetland site. The hydrology of Montrose Basin is unusual with the main mudflat at a relatively high level, being exposed for a long period of each tidal cycle. The mudflats remain wet throughout the cycle and can therefore support the abundant invertebrate fauna. Most of the site lies below the high-water mark of ordinary spring tides, but, particularly at the western end, there is a natural transition from reedbed and saltmarsh to fen and wet grassland. There is also some arable land within the SSSI site boundary. The SSSI covers an area of 953.42 ha. (SNH, 2015f).

The site supports a wide range of species, including very large numbers of wildfowl and waders. It was selected as an SPA due to its internationally important wintering populations of pink-footed geese, greylag geese, wigeon, redshank, knot, oystercatcher and eider and it is also nationally important for mute swans. The Basin is used in many ways by its bird population - for example as a nesting area, roosting site, food source, staging post and refuge from disturbance elsewhere. Overwinter the birds also feed on crops being grown on the surrounding farmland (SNH, 2015f).

The management objectives laid out in the site management document require populations of all notified bird species to be maintained by avoiding significant disturbance at Montrose Basin during roosting times and maintaining suitable roosting habitats (SNH, 2015f).

The distance by sea from the proposed development to this SSSI was estimated at 58 km (Table 10.8). The straight line distance is only slightly shorter at approximately 54 km. Given the relatively large intervening distance no connectivity between the notified habitats and the proposed development is suggested. With the possible exception of eider, available foraging ranges for those species designated for the SSSI indicate that none would suggest connectivity to the area of the proposed development (Table 10.8 and Table 10.5). Eider may travel up to a maximum of 80 km although the global mean is much smaller at 2.4 km and the sample size is small hence confidence in the data is poor (Table 10.5). However, as a precaution the site is included in the ES to capture this potential interaction. Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.5.5 Rickle Craig - Scurdie Ness SSSI

This site is located on the Angus coastline, stretching approximately 5 km from just north of Lunan Bay to the mouth of the River South Esk at Montrose. This rocky stretch of coastline is of particular importance, and was notified for, the range of saltmarsh communities present and for the examples of unimproved and species-rich maritime cliff grassland vegetation which support a wide range of uncommon plants (Table 10.8). These areas of rich vegetation also support a diverse mollusc fauna. The site also contains important examples of exposures of igneous rocks of Devonian age which includes an area where the mineralogy of agates can be studied. The SSSI covers an area of 72.17 ha. (SNH 2015f).

The large intervening distance of 55 km indicates that there will be no connectivity between any of the notified geological and biological natural features and the proposed development.

10.4.5.6 Whiting Ness - Ethie Haven SSSI

This SSSI forms the longest continuous stretch of sea cliffs and rocky shore in Angus, measuring approximately 11 km in length from Victoria Park on the edge of Arbroath to almost as far north as Lunan Bay. It supports nationally important numbers of nesting seabirds and over-wintering waders, a wide range of coastal grassland and coastal cliff communities and the small blue butterfly *Cupido minimus*, a Scottish rarity. The site is also geologically important for its exposures of Upper Old Red Sandstone and Ethie Lavas. The SSSI covers an area of 136.17 ha. (Table 10.8; SNH 2015f).

The site has the largest breeding seabird colony in Angus with nationally important numbers of kittiwakes, fulmars, puffins, shags, and over-wintering turnstones and purple sandpipers, which feed and roost on the flat, rocky shoreline. All of the seabirds that the site is notified for were reported to be in favourable condition in 2005 apart from puffins, which have seen a dramatic decline in recent years, falling from 2,540 occupied burrows in 1985/86 to only 190 in 2001. It is unclear exactly why there has been this dramatic decline but it is thought likely that reduction in sand eel populations, a key food source for puffins, may be one factor. The site management document indicates, more broadly, that breeding seabirds are largely dependent on the sand eel population for feeding and as such any significant decline of the sand eel population is likely to have a detrimental effect on the breeding success of the seabird colonies (SNH, 2015f). The site does not overlap with any other designated area.

The distance by sea from the proposed development to this site was estimated at 65 km (Table 10.8). The straight line distance is only slightly shorter at approximately 62 km. Connectivity between the site and the proposed development is implied by the foraging ranges for fulmar, puffin, shag and kittiwake. Relevant assessments are available in Chapter 14: Marine Ornithology.

10.4.5.7 Monifieth Bay SSSI

Monifieth Bay is situated on the north shore of the outer Firth of Tay 5 km east of Dundee and immediately south of Broughty Ferry continuing along the coast for approximately 4 km to Monifieth. The single Notified Feature of statutory interest is sanderling *Calidris alba* (Table 10.8). The extensive sand/mudflats are known to have a rich invertebrate population and at low tide provide a feeding ground for wintering waders, specifically important numbers of sanderling. The SSSI covers an area of 199.23 ha. (SNH, 2015f).

The entire SSSI is also a constituent part of the Firth of Tay and Eden Estuary SPA on account of its contribution to supporting internationally important numbers of wintering waders and sea-duck. The SSSI is also a constituent part of the Firth of Tay and Eden Estuary SAC for common seal as well as the habitats (intertidal mudflats and sandflats, and subtidal sandbanks) that support the large numbers of waders and ducks that use the site to feed (SNH, 2015f). The Firth of Tay and Eden Estuary is also a site listed under the Ramsar Convention for its wetland birds (SNH, 2015f).

The distance by sea from the proposed development to this site is estimated at 95 km (Table 10.8). The straight line distance is shorter at approximately 87 km. Given the large distance no connectivity between the habitats and the proposed development is suggested.

Sanderling are a non-breeding passage migrant which can be found in a variety of coastal habitats over winter including open sandy beaches exposed to the sea, the outer reaches of estuaries, rocky and muddy shores and mudflats. During the winter they may feed on small molluscs, crustaceans, polychaete worms and adult, larval and pupal insects as well as fish and carrion on occasion (BirdLife International, 2015). Typically they feed as close to the water as possible, running downslope between waves to probe the sand (McLachlan and Brown, 2006).

The intertidal survey carried out to support the ES indicated that much of the centre of Nigg Bay was dominated by mobile sands with little or no fauna (ES Appendix 12-A: Intertidal Benthic Ecological Characterisation Survey). Given the paucity of fauna in the available exposed sandy beach it is not considered likely that passage migrants such as sanderling will be utilising Nigg Bay. The species was not recorded from the vantage point survey work undertaken between June 2014 and March 2015 (refer to ES Appendix 14-A: Marine Ornithology Vantage Point Survey Report). Therefore, connectivity between Monifieth Bay SSSI and the proposed development is not suggested.

10.4.5.8 Inner Tay Estuary SSSI

The Tay Estuary is one of the largest estuaries in Scotland. It stretches for approximately 20 km from the confluence of the Rivers Earn and Tay in the west to the Tay rail bridge in the east. The site is 2.5 km at its widest and consists primarily of intertidal sand and mudflats that extend seawards out to the main channel. The site is important for its wintering populations of roosting grey geese, its breeding birds, including several nationally important populations, its saltmarsh habitats, and habitats

demonstrating the transition from saltmarsh to freshwater fens and dry land (Table 10.8). The SSSI covers an area of 4,115.38 ha. (SNH, 2015f).

The site lies within the Firth of Tay and Eden Estuary SPA which is designated for both breeding and non-breeding birds. The site also lies within the Firth of Tay and Eden Estuary Ramsar site which is designated for bar-tailed godwit, greylag goose, pink-footed goose, and Redshank. In addition, the site also lies within the Firth of Tay and Eden Estuary SAC which is designated for common seals, intertidal mudflats and sandflats, and subtidal sandbanks.

Neither the saltmarsh nor the transition saltmarsh SSSI interest features have any connectivity with the proposed development given the large intervening distance and are therefore not considered further within this ES (refer to ES Appendix 1-D: Scoping Opinion 2014). Similarly no connectivity is suggested with respect to relevant bird species notified for the SSSI including pink-footed goose, cormorant and greylag goose (Table 10.8 and Table 10.5). Goldeneye were recorded during the Nigg Bay vantage point surveys between June 2014 and March 2015 (refer to ES Appendix 14-A: Marine Ornithology Vantage Point Survey Report). but these are a widespread winter visitor which breed mainly in Scandanavia and western Russia. The Firth of Tay and Eden estuary and the Inner Moray Firth SPAs have been identified as important sites for the species (JNCC, 2015u) although again, no connectivity is suggested.

Potential effects of the proposed development on common seal were identified by SNH as comprising effects 1, 2, 3 and 5 from Table 10.3. Assessments are contained in Chapter 15: Marine Mammals and Volume 4: HRA.

10.4.5.9 Tayport - Tentsmuir Coast SSSI

The area of this coastal strip in Fife is quite large extending from Tayport to Kinshaldy, approximately 10 km due north of St Andrews and includes the Abertay sands. It is a key geomorphological site for the study of active beach and coastal processes, in particular those associated with coastal progradation (shoreline advance). It is exceptional in Scotland for the rate and amount of coastal accretion (sediment accumulation) since the time of the post-glacial sea-level high. This accretion is actively continuing and is due to the massive sediment load carried to the sea by the River Tay and built into extensive bar and spit systems. The SSSI covers an area of 1,261.29 ha. (SNH, 2015f).

The intertidal flats regularly support a large assemblage of wintering waterfowl including nationally important passage or wintering populations of pink-footed goose, eider, long-tailed duck, common scoter, red-breasted merganser, goosander and bar-tailed godwit in numbers in excess of 1% of their British populations (Table 10.7). The site is particularly important for wintering eider, with peak numbers exceeding 8,300, some 11.45% of the British wintering population (SNH, 2015f). The outer sandflats provide for a nationally important pupping and moulting haul-out for approximately 150 common seals. Grey seals also use the area as a summer haul-out, in numbers averaging around 1,000, but not for breeding or moulting (SNH, 2015f).

With the exception of the bar-tailed godwit all bird species listed for the SSSI were observed during the vantage point surveys undertaken at Nigg Bay between June 2014 and March 2015. The site is part of the Firth of Tay and Eden Estuary SPA (see Section 10.4.3.7) and as indicated in that section

the site has been screened in for the HRA (Volume 4: HRA) and relevant bird species such as eider have been assessed in Chapter 14: Marine Ornithology. Given the large intervening distance no connectivity between the notified habitats and the proposed development is suggested. However, the SSSI is part of the Firth of Tay and Eden Estuary SAC with potential effects of the proposed development on common seal identified by SNH as comprising points 1, 2, 3 and 5 (Table 10.3). Relevant assessments are available in Chapter 15: Marine Mammals and Volume 4: HRA.

10.4.5.10 Eden Estuary SSSI

The Eden Estuary SSSI lies between St Andrews and the Firth of Tay and contains extensive intertidal flats of mud and sand. The mudflats are very varied, with beds of mussels, brown algae and eelgrass, and support a rich invertebrate fauna. Fringing the mudflats are areas of saltmarsh and swamp including the largest extent of saltmarsh in Fife. A wide diversity of estuarine and coastal vegetation types are represented. Nationally or internationally important populations of species of waders and waterfowl occur in winter or on passage (Table 10.8). The SSSI covers an area of 1,097.88 ha. (SNH, 2015f).

Nationally important wintering populations of oystercatcher, black-tailed and bar-tailed godwits, grey plover and redshank use the estuary for feeding and roosting. Many other waders visit the site on passage in spring or autumn, including nationally important numbers of ringed plover. Nationally important wintering flocks of common and velvet scoter, scaup and eider occur, principally in St Andrews Bay and near the Eden Mouth. The estuary is also used by nationally important numbers of greylag geese as a nocturnal roost. The estuary is of international importance for shelduck in winter and for red-breasted merganser in autumn.

As with other SSSI constituent parts of the Firth of Tay and Eden Estuary SPA connectivity between the proposed development and this site is suggested with regard, for example, to the presence of eider. Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA. Given the large intervening distance, no connectivity between the notified habitats and the proposed development is suggested.

The SSSI is part of the Firth of Tay and Eden Estuary SAC with potential effects of the proposed development on common seal identified by SNH as comprising effects 1, 2, 3 and 5 in Table 10.3). Assessments are contained in Chapter 15: Marine Mammals and Volume 4: HRA.

10.4.5.11 Firth of Forth SSSI

The Firth of Forth SSSI covers the coastline stretching from Alloa along the Fife coast as far as Crail and along the Falkirk and Lothian coast to Dunbar. There is an extensive mosaic of intertidal and coastal habitats including extensive mudflats which make up much of the intertidal zone with areas of sand, shingle, rock and boulders. Associated coastal habitats include saltmarsh, grassland and sand dunes. The SSSI covers an area of 7,423.19 ha (SNH, 2015f).

The Firth of Forth is the second most important estuarine area for wintering birds in Scotland, and eleventh in the UK, and is significant both in terms of waterfowl density and abundance. Most of the wildfowl and waders in the Firth of Forth are found at internationally or nationally important levels with

the estuary west of the Forth Bridges having extensive invertebrate-rich intertidal mudflats which provide feeding grounds for both wintering and migratory birds (SNH, 2015f).

East of the bridges, the mudflats become sandier but still support many feeding birds. Here, rocky shorelines are also more prevalent, and are home to a slightly different mix of birds compared to the mud and sandflats. Shingle beaches are also found in this area. Offshore, the deeper waters of the Forth attract large numbers of sea ducks, grebes and divers. These include flocks of eider for which the Forth is an important moulting area particularly between Gullane and Broad Sands. Nationally important numbers of breeding eider occur at Aberlady Bay, on the North Berwick Coast (SNH, 2015f).

The Firth of Forth also supports an important post-breeding passage population of Sandwich terns which, while currently in favourable condition, is declining (SNH, 2015f).

The site overlaps with the Forth of Firth SPA and as reported, some interaction between the proposed development and the non-breeding waterfowl assemblage has been identified, in particular with regard to eider. This is assessed in Volume 4: HRA and Chapter 14: Marine Ornithology.

10.4.5.12 Isle of May SSSI

The Isle of May is composed of basaltic rock and has vertical sea cliffs up to 60 m high on the west coast from where the island slopes down towards sea level in the east. The island supports internationally important numbers of breeding seabirds and grey seals, *Halichoerus grypus*. Grey seals inhabit the Isle all year round. During the breeding season in autumn, the island holds the largest grey seal colony on the east coast and the fourth largest in the UK (SNH, 2015f).

The island regularly supports eleven species of breeding seabirds and is the only large seabird colony in Fife. The puffin colony is the fifth largest in the UK and is internationally important while shag, guillemot and kittiwake are found in nationally important numbers. Eider also breed in nationally important numbers. In winter, the island supports nationally important numbers of turnstone and purple sandpiper (SNH, 2015f).

The site overlaps with the Isle of May SAC and NNR, and the Forth Islands SPA. Connectivity between the site and the proposed development is implied by the presence of the bird species and grey seal. This is assessed in Volume 4: HRA, Chapter 14: Marine Ornithology and Chapter 15: Marine Mammals.

10.4.5.13 Sands of Forvie and Ythan Estuary SSSI

The site has a diversity of coastal habitats, plants and birdlife. Forvie has extensive sand dunes, with freshwater lochs and a section of rocky sea cliff. The Ythan Estuary, one of the few largely unaltered estuaries of Europe, has intertidal flats and saltmarsh. The dunes hold important breeding colonies of terns and eider duck and the estuary supports important populations of wintering and passage wildfowl and waders (Table 10.7). The site also supports diverse assemblages of breeding birds and vascular plants. The SSSI covers an area of 990.5 ha. (SNH, 2015f).

The site management document identifies that coastal engineering or other activities in Aberdeen Bay could have impacts on the sediment supply, which is the driver for much of the dynamics of the

beach/dune system. Furthermore, the tern breeding colonies are largely dependent on the availability of suitable fish for feeding and as such any significant decline in fish stocks would be likely to have a detrimental effect on the breeding success of the colonies (SNH, 2015f).

Connectivity between the site and the proposed development is implied, in particular, by the foraging ranges for sandwich and common tern, eider and pink-footed goose (Table 10.8, Table 10.5, RPS 2008). Assessments are contained in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.5.14 Collieston to Whinnyfold Coast SSSI

This is a long narrow site with sea cliffs up to 40 m high, steeply sloping grassland and one small area of beach. It is located on the east coast of Aberdeenshire about 15 km south of Peterhead. The coast here is important for geology and for coastal habitats and seabird colonies including one of the largest colonies in the Grampian region. Several of the headlands captured by the site support large colonies of cliff-nesting seabirds, in particular kittiwake, guillemot, razorbill and fulmar, as well as small numbers of puffin (Table 10.8). When considered in conjunction with the seabird colonies of the neighbouring Bullers of Buchan SSSI as part of the Buchan Ness to Collieston SPA, the breeding population of kittiwake in particular, contribute to internationally important numbers of this species. The seabird colony is most vulnerable to factors external to the site, for example over-fishing and oil spills. The SSSI covers an area of 103.9 ha. (SNH, 2015f).

Connectivity between the site and the proposed development is implied by the foraging ranges for fulmar, kittiwake, razorbill and guillemot, the four bird species notified for the site (Table 10.8 and Table 10.5). Assessments are contained in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.5.15 Meikle Loch and Kippet Hills SSSI

Meikle Loch is a small eutrophic loch with little aquatic vegetation. It lies in an area of intensive farming and is one of the major roosts for the large numbers of greylag and pinkfooted geese which occur in the Grampian lowlands from autumn to spring. Between 15% and 20% of the north-west European population of pinkfooted geese and up to 10% of the greylag population use the loch regularly and the loch is consequently of European and international importance for these species (Table 10.8). Other wildfowl occur in smaller numbers on passage and in winter, including teal, pochard, wigeon and tufted duck. The SSSI covers an area of 71.7 ha. (SNH, 2015f).

Connectivity between the site and the proposed development is not implied as the foraging ranges for greylag and pink-footed geese are estimated at 15 km to 20 km and the straight line distance to the site is approximately 27 km (Table 10.8; RPS 2008).

10.4.5.16 Bullers of Buchan Coast SSSI

This site comprises the sea cliffs and coastal strip from Buchan Ness, near Peterhead, southwards to just beyond Slains Castle, near Cruden Bay, including the Bullers of Buchan (a collapsed sea cave). The cliffs, slopes and inshore stacks are of special geological and biological interest. The sea cliffs and inshore stacks support a colony of breeding seabirds which is the largest in north-east Scotland and forms part of the Buchan Ness to Collieston Coast SPA. The overall colony is of international importance. This assemblage includes nationally important populations of kittiwake and guillemot

(Table 10.8). Shag, herring gull, fulmar, razorbill, and puffin are also present. The SSSI covers an area of 104.06 ha. (SNH, 2015f).

The site management document states that the breeding seabirds are largely dependent on the sand eel population for feeding and as such any significant decline of the sand eel population is likely to have a detrimental effect on the breeding success of the seabird colonies (SNH, 2015f).

Connectivity between the site and the proposed development is implied by the foraging ranges for shag, guillemot and kittiwake, the three bird species notified for the site (Table 10.8 and Table 10.5). Assessments are contained in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.5.17 Loch of Strathbeg SSSI

The Loch of Strathbeg site is important for its coastal landforms and habitats and associated flora and fauna, in particular its loch, fen, sand dune and saltmarsh habitats and winter waterfowl. The site is one of the most important sites for passage and wintering wildfowl in Britain, and adjacent fields and pools provide important roosting and feeding sites for geese. In particular, it is an important staging area for migratory wildfowl from Scandinavia and Iceland/Greenland. The numbers of whooper swan and greylag and pink-footed geese are of international importance, representing 1% of Icelandic, 6% of Icelandic and 25% of total Icelandic/Greenlandic populations respectively. In addition, nationally important concentrations of goldeneye frequently occur (Table 10.8). Overall, the number of overwintering waterfowl is of international importance. During the breeding season the loch and adjacent areas supports a particularly diverse breeding bird community including mute swan, shelduck, redshank, teal, tufted duck, water rail, common tern, marsh harrier, sedge and grasshopper warblers and reed bunting. The SSSI covers an area of 953.9 ha. (SNH, 2015f).

The site management document notes that the continued natural and dynamic evolution of the coastal edge and the maintenance of the sediment supply which currently moves along shore to the north-west from Rattray Head is of critical importance. Rattray Head itself is fed by sediment moving northwards along the coast from St Fergus (some 6 km to the south). Some aspects of this supply will naturally diminish, such as the offshore glacial reserves. However, the longshore drift of sediment north and north-westwards along the coast, where possible, should not be hindered or prohibited by the construction of further coastal protection works at any point along the coast encompassed by, or down-drift of, the site (SNH, 2015f). Given the large intervening distance no connectivity between the notified habitats and the proposed development is suggested.

None of the bird species for which this site has been designated have foraging ranges which would indicate connectivity to the area of the proposed development (Table 10.8 and Table 10.5). The Loch of Strathbeg SSSI is therefore not considered further in this assessment. However, see Section 10.4.3.3 for information on the SPA.

10.4.5.18 Rosehearty to Fraserburgh Coast SSSI

This open and exposed coastline of relatively low relief between Rosehearty and Fraserburgh is unusual in containing fairly extensive areas of intertidal mud and sand flats interspersed with low rocky outcrops and coastal lagoons backed by a narrow fringe of sand dune and saltmarsh. The site is important for the numbers of passage and wintering seaduck and waders which it supports. It is of

national importance for turnstone and purple sandpiper, regularly holding over 500 and 250 individuals respectively. Nationally significant concentrations of eider and curlew also occur, and a wide variety of other waders and wildfowl (Table 10.8). The site management document considers that the principal factors affecting the populations of wildfowl are likely to be external to the site. The SSSI covers an area of 135.8 ha. (SNH, 2015f).

Curlew and turnstone were both observed at Nigg Bay during vantage point surveys between June 2014 and March 2015 (ES Appendix 14-A: Marine Ornithology Vantage Point Survey Report) but these are common winter migrants and no connectivity with Nigg Bay is suggested. Purple sandpiper were not observed during the vantage point surveys in Nigg Bay. Eider may travel up to a maximum of 80 km although the global mean is much smaller at 2.4 km and the sample size is small, hence confidence in the data is poor (Table 10.5). Suggested connectivity implied by birds such as eider have been assessed in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.5.19 Gamrie and Pennan Coast SSSI

Gamrie and Pennan are located on the north coast of Aberdeenshire, to the east of Macduff. This section of coast is important for its geology and for coastal habitats and seabird colonies. Part of the Gamrie and Pennan Coast SSSI falls within the Troup, Pennan and Lion's Heads SPA and as such is a constituent part of that site. The extensive sea cliffs support large breeding colonies of seabirds which, totalling well over 20,000 individuals, are of international importance. The principal species, guillemot and kittiwake, are present in internationally important numbers, with smaller numbers of razorbill, fulmar, puffin and shag, together with herring and greater black-backed gulls. The site holds the largest colony of gannet on the Scottish mainland (Table 10.8). The seabird colonies are most vulnerable to factors external to the site, for example over-fishing and oil spills. The SSSI covers an area of 315.2 ha. (SNH, 2015f).

The distance between the site and the proposed development was estimated at 87 km. Both fulmar and gannet have much larger foraging ranges and both have been recorded during the Nigg Bay vantage point surveys between June 2014 and March 2015 (ES Appendix 14-A: Marine Ornithology Vantage Point Survey Report). Kittiwake, guillemot and razorbill all have maximum foraging distances in excess of 87 km. However, the mean of the maximum ranges are lower and, the global mean foraging distances considerably lower, than 87 km for these three species (Table 10.8 and Table 10.5). Connectivity between the site and the proposed development is therefore, to a degree, implied for the site. Assessments are contained in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.6 **National Designations: Nature Conservation Marine Protected Areas (NCMPAs)**

For each of the NCMPAs considered in this section, JNCC and SNH have produced a site summary document, providing a brief overview of the site and the protected features; a data confidence assessment, setting out the confidence in the presence and extent of the protected features; an assessment against the MPA selection guidelines, detailing the application of the five stages of the Scottish MPA Selection Guidelines; and management option papers which consider mechanisms for achieving the conservation objectives for each of the protected features in the NCMPA.

Three sites have been considered in this section, one of which is at an earlier stage of the selection process (and as such does not have any condition assessment associated with it), as listed in Table 10.9.

Table 10.9: NCMPAs considered within the assessment

Site Name	Distance [km]*	Description/Interest Feature(s)	Condition Assessment
Firth of Forth Banks Complex [^]	44	Ocean quahog aggregations Offshore subtidal sands and gravels Shelf Banks and Mounds Moraines representative of the Wee Bankie Key Geodiversity Area	Favourable, uncertain Favourable, uncertain Favourable, uncertain Favourable, uncertain
Turbot Bank	64	Sandeels	Favourable, uncertain
Proposed Nature Conservation Marine Protected Area (NCMPA)			
Southern Trench	45	Burrowed mud (BM) Fronts (FR) Minke whale (MW) Shelf deeps (SD) Quaternary of Scotland - sub-glacial tunnel valleys and moraines (GEO) Submarine Mass Movement - slide scars (GEO)	
Notes:			
* This is an approximate distance by sea from the proposed development.			
[^] OSPAR MPA site			

As detailed in Section 10.3 (Consultation) SNH noted in its scoping response to Transport Scotland that, with regard to hydrodynamics, sediments and coastal processes, both the Southern Trench and Turbot Bank would not be affected by the proposed development. No mention was made regarding the Firth of Forth Banks Complex NCMPA but for completeness it is included here.

10.4.6.1 Firth of Forth Banks Complex NCMPA

The Firth of Forth Banks Complex NCMPA is located in offshore waters to the east of Scotland, and includes the Berwick, Scalp and Montrose Banks and the Wee Bankie shelf banks and mounds. Strongly influenced by water currents, the mosaic of different types of sands and gravels create a unique mixture of habitats that overlie the underwater banks and mounds within the NCMPA (JNCC, 2015v).

The interest features include ocean quahog aggregations and offshore subtidal sands and gravels (Table 10.9). No connectivity with the proposed development is indicated given the large intervening distance of 44 km (Table 10.9).

10.4.6.2 Turbot Bank NCMPA

Turbot Bank NCMPA is located off the east coast of Scotland and lies within an area of sandy sediment, including part of the shelf bank and mound feature known as 'Turbot Bank'. The protected feature for which the site was selected is sandeel (Table 10.9). These are closely associated with sand habitats, living buried in the sand for months at a time. The Turbot Bank NCMPA encompasses

areas where high numbers of sandeels have been found. Sandeels play an important role in the wider North Sea ecosystem, providing a vital source of food for larger fish, seabirds and marine mammals. Turbot Bank has the potential to act as a source of young sandeels for maintaining and restocking surrounding areas.

No connectivity with the proposed development is indicated given the large intervening distance of 64 km (Table 10.9). This conclusion is in line with advice received from SNH on the potential for Turbot Bank to be affected by this proposal.

10.4.6.3 Southern Trench proposed NCMPA

This is a proposed NCMPA shaped around the Southern Trench, a large undersea valley consisting of an area of deep water (~200 m) extending along the south of the outer Moray Firth, approximately 10 km from the coast between Banff and Fraserburgh. The southern boundary of the MPA proposal has been shaped to incorporate the core part of the front off Fraserburgh. The geology and hydrography of the MPA proposal form a backdrop for a further two protected features: burrowed mud and minke whale (Table 10.9). The MPA proposal also overlaps the marine part of the Troup, Pennan and Lion's Heads SPA.

No connectivity with the proposed development is indicated given the large intervening distance of 45 km and the nature of the development (Table 10.9). Potential effects on minke whale have been assessed in Chapter 15: Marine Mammals.

10.4.7 **National Designations: National Nature Reserves (NNR)**

NNRs contain examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats or to provide special opportunities for scientific study of the habitats communities and species represented within them. In addition, they may be managed to provide public recreation that is compatible with their natural heritage interests. Most reserves have habitats and species that are nationally or internationally important. Three NNRs have been included in this assessment, all of which overlap with one or more designation (Table 10.10)

Table 10.10: NNRs considered within the assessment

Site Name	Distance [km]*	Description/Interest Feature(s)	Conservation Objectives
Forvie	20	Area: 1,000 ha Features included in: Sands of Forvie SAC; Ythan Estuary, Sands of Forvie and Meikle Loch SPA (Section 10.4.3.1); Ythan Estuary and Meikle Loch RAMSAR (Section 10.4.4.1); and, Sands of Forvie and Ythan Estuary SSSI (Section 10.4.5.13)	To allow natural processes to maintain the dune system and to minimise human impacts.
			To work with others to reduce the effects of pollution in the River Ythan, and restore the estuary to a more natural state.
			To carry out necessary management to enable nesting eiders and terns to breed successfully.
			To ensure the present variety of habitats and species is retained at Forvie.
			To work with others to protect and manage Forvie Kirk, deserted village and other archaeological and cultural features.
			To commission, support and encourage research, survey and monitoring work.
St Cyrus	48	Area: 92 ha Features included in the St Cyrus and Kinnaber Links SSSI (Section 10.4.5.3).	Allow the cliff habitats to develop naturally apart from the removal of invasive species.
			Allow the dunes and their vegetation to evolve naturally, only intervening if necessary to prevent human damage and remove invasive species.
			Increase the area of species rich dune grassland.
			Carry out direct management for key groups of species where clear, targeted action will be beneficial.
Tentsmuir	91	Area: 564 ha Features are included in: Firth of Tay and Eden Estuary SAC (Section 10.4.2.4); Firth of Tay and Eden Estuary SPA (Section 10.4.3.7); Tayport - Tentsmuir Coast SSSI (Section 10.4.5.9).	Dune and coastal features: Maintain overall extent and condition of dune and coastal SAC and SSSI qualifying habitats and species at Tentsmuir, Tayport and Morton Lochs to at least 'unfavourable recovering condition'.
			Open water and wetlands: Maintain extent and quality of open water, fen and marsh at Morton Lochs.
			Species management: Maintain the biodiversity interest of the reserve and continue to contribute records to national programmes.
Isle of May	110	Area: 56.6 ha Features are included in: Isle of May SSSI (Section 10.4.5.12); Isle of May SAC (Section 10.4.2.5) and the Forth Islands SPA (Section 10.4.3.9)	To ensure the reserve continues to provide appropriate nesting habitat for the range and populations of breeding seabirds. Continue commitment to long-term monitoring and use this to inform understanding of the impacts of climate change and marine developments on seabirds.
			Ensure the reserve continues to provide appropriate breeding habitat for grey seals and continue commitment to their long-term monitoring.
			Manage the island to protect and where possible enhance habitats and species.
Note: * This is an approximate distance by sea from the proposed development			

10.4.7.1 Forvie NNR

Forvie NNR is located on the northeast coast of Scotland between Newburgh and Collieston, approximately 20 km north of the city of Aberdeen. Coastal dunes stretch for 24 km along this coastline, divided in two by the River Ythan. The Reserve includes the dunes and dune heath north of the River on the Forvie peninsula, as well as the tidal areas of the Ythan Estuary. Home to a variety of wildlife, Forvie is particularly renowned for its birds, including the largest breeding colony of eiders in

Britain, four species of breeding terns and the wealth of wildfowl and waders on the estuary. Forvie became an NNR in 1959; it has since been recognised as internationally important and is now one of the sites in the Natura 2000 network of protected areas in Europe and is also listed under the Ramsar Convention as a Wetland of International Importance. The reserve covers an area of 973 ha (SNH, 2015f and SNH, 2009).

The relevant management objectives for the NNR with respect to natural and cultural heritage include (SNH, 2009):

- To allow natural processes to maintain the dune system and to minimise human impacts;
- To work with others to reduce the effects of pollution in the River Ythan and restore the estuary to a more natural state;
- To carry out necessary management to enable nesting eiders and terns to breed successfully; and
- To ensure the present variety of species is retained at Forvie.

This site overlaps with the Sands of Forvie SAC; Ythan Estuary, Sands of Forvie and Meikle Loch SPA (see Section 10.4.3.1); Ythan Estuary and Meikle Loch Ramsar (see Section 10.4.4.1); and, Sands of Forvie and Ythan Estuary SSSI (see Section 10.4.5.13). The SAC, which is designated for four supralittoral Annex I dune habitats with no connectivity to the proposed development, was scoped out of the assessment (refer to ES Appendix 1-D: Scoping Opinion 2014). The other designations have been considered here and assessments are available in the relevant sections.

10.4.7.2 St Cyrus NNR

St Cyrus NNR is on the Aberdeenshire coast approximately 7 km north of Montrose. The Reserve includes a sandy beach, backed by extensive dunes and species rich grassland, between the North Sea and high inland cliffs. The ridge of sand dunes and the cliffs provide shelter, creating an unusually warm climate. The Reserve is home to several rare plant and insect species, some of which are at their northern limit in Britain. The Reserve also supports a variety of breeding birds. Waders and wildfowl winter on the estuary or use it on migration. Cliff nesting seabirds are counted as part of the JNCC's National Seabird Monitoring Scheme. The reserve covers an area of 92 ha (SNH, 2015f and SNH, 2010).

This site overlaps with the much larger St Cyrus and Kinnaber Links SSSI (see Section 10.4.5.3). No connectivity with the proposed development is suggested.

10.4.7.3 Tentsmuir NNR

Tentsmuir NNR is the extreme north-east point of Fife, on the east coast of Scotland. It lies 10 km north of St Andrews and a similar distance south of Dundee. The reserve consists of three areas: Tentsmuir Point, Tayport Heath and Morton Lochs. They are all part of a once extensive sand dune system, stretching between the Eden and Tay estuaries. Tentsmuir Point is an extensive area of dunes and mudflats which continues to grow seaward. Some of the sediment load carried seaward by the River Tay is deposited at Tentsmuir Point and it has been noted as one of the fastest growing parts of Scotland. The dunes constantly change and shift as sand is eroded and deposited by the sea.

The point is an internationally important area for waders and wildfowl, providing a rich food source and resting place. It is also an important area for both grey and common seals, both species being found at Tentsmuir throughout the year. Moving inland the dunes become dominated by marram grass stabilising the terrain and allowing dune heath to develop. Between the dune ridges are extensive dune slacks rich in wildflowers. In summer the slacks provide sheltered breeding sites for birds. The NNR is managed by SNH. The reserve covers an area of 563.84 ha (SNH, 2015f and SNH, 2015g).

The Reserve is part of the Firth of Tay and Eden Estuary SAC (see Section 10.4.2.4); the Firth of Tay and Eden Estuary SPA (see Section 10.4.3.7); the Firth of Tay and Eden Estuary Ramsar site (see Section 10.4.4); and, the Tayport – Tentsmuir Coast SSSI (see Section 10.4.5.9). These designations have been considered within this chapter and links to impact assessments are provided in the relevant sections.

10.4.7.4 Isle of May NNR

The Isle of May NNR lies on the east coast of Scotland, in the entrance of the Firth of Forth. Available site information notes that for its small size the island has a great variety of wildlife including a rich bird life, seals and reefs. During the summer months the cliffs on the Isle of May host large seabird colonies, and in the autumn the largest Atlantic grey seal colony in eastern Britain breeds there. In the spring and autumn the island is an important site for migrant birds passing to and from their breeding grounds. The reserve covers an area of 56.6 ha (SNH, 2015f and SNH, 2015h)

The site overlaps with the Isle of May SSSI, SAC and the Forth Islands SPA. Connectivity between the site and the proposed development is implied by the presence of the grey seal. This is assessed in Volume 4: HRA and Chapter 15: Marine Mammals.

10.4.8 Local Designations: Local Nature Reserves

LNRs are a statutory designation. Four sites have been identified and are considered in this section (Table 10.11).

Table 10.11: LNRs considered within the assessment

Site Name	Distance [km]*	Description/Interest Feature(s)
Donmouth	5.5	Designated in 1992, it is a beach site in the historic Old Aberdeen part of the City where the River Don meets the sea. The main habitats present are mudflats, saltmarsh, sand dunes, scrub, grassland and woodland.
Montrose Basin	58	Offers a variety of different zones including mud, fresh water, sea water, brackish water, saltmarsh, reedbed, unimproved grassland, and arable land.
Inner Tay Estuary	105	Offers a variety of coastal environments marshes, mudflats, beaches, and dunes.
Eden Estuary	96	The bulk of the reserve is made up of intertidal mud and sand flats
Note: *This is an approximate distance by sea from the proposed development		

10.4.8.1 Donmouth LNR

Donmouth LNR was designated in 1992 and is a beach site in the historic Old Aberdeen part of the City where the River Don meets the sea. The main habitats present are mudflats, saltmarsh, sand dunes, scrub, grassland and woodland. The site is adjacent to the Ythan Estuary and Sands of Forvie dSPA. The reserve covers an area of 36 ha. (SNH, 2015f).

Although the Reserve is only 5.5 km north of Nigg Bay it is unlikely that physical processes link the two sites as longshore drift from wave action in the southern section of Aberdeen Bay is southwards (Stapleton and Pethick, 1996). Therefore no connectivity between the proposed development and the habitats within the LNR is suggested.

10.4.8.2 Montrose Basin LNR

There is a variety of zones within the Montrose Basin LNR ranging from mud, freshwater, seawater, brackish water, saltmarsh, reedbed, unimproved grassland and arable land. The Reserve is particularly noted for the birds that breed, feed and roost there, but it is also notable for its plant life (both in and out of the water). Being a LNR, it is also important for the leisure activities it supports that co-exist with the wildlife: birdwatching, sailing, fishing, wildfowling and bait digging. The reserve area overlaps with the SPA (see Section 10.4.3.6), Ramsar (see Section 10.4.4.2) and SSSI (see Section 10.4.5.4) sites and covers an area of 1,024 ha. (SNH, 2015f).

As with the SSSI, given the relatively large intervening distance no connectivity between the notified habitats and the proposed development is suggested. However, as a precaution the site is included in the ES to capture the potential interaction suggested by the presence and importance of eider to the designated sites. Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

10.4.8.3 Inner Tay Estuary LNR

The Inner Tay estuary holds the most extensive continuous reedbeds in Britain and the coastal habitats including marshes, mudflats, beaches and dunes support a diverse range of wildlife. The area is part of the Tay Estuary Forum that was launched in 1997 and is a voluntary group promoting *'the wise and sustainable use of the Tay Estuary and associated coastline'*. The Tay estuary holds populations of birds that have been recognised as having both national and international importance.

With some small differences in boundaries this LNR sits within the larger Inner Tay Estuary SSSI (10.4.5.8) and the Firth of Tay and Eden Estuary SAC (see Section 10.4.2.4), SPA (see Section 10.4.3.7) and Ramsar (see Section 10.4.4) sites. This LNR occupies an area of 1,176 ha (SNH 2015f). Connectivity has already been commented on in the relevant sections for these other associated designations.

10.4.8.4 Eden Estuary LNR

The Eden Estuary is the third oldest reserve in Scotland. The bulk of the reserve is made up of rich intertidal mud and sand flats which provide food for thousands of birds. The area overlaps with the Eden Estuary SSSI (see Section 10.4.5.10) and the Firth of Tay and Eden Estuary SPA (see Section 10.4.3.7), SAC (see Section 10.4.2.4) and Ramsar (see Section 10.4.4) sites. This LNR

occupies an area of 891 ha (SNH, 2015f). Connectivity has already been commented on in the relevant sections for these other associated designations.

10.4.9 Local Designations: Local Nature Conservation Sites (LNCS)

Areas have been identified by Aberdeenshire Council (proposed LDP 2016 sites) and Aberdeen City Council as being of regional or local importance for a particular biological or geological interest. LNCS have been identified based on an agreed set of criteria that is consistent across Scotland. These include habitat and species rarity, important populations of a particular species, and the presence of rock outcrops or geomorphological features. The criteria were set out in a 2004 document entitled 'Establishing and Managing Local Nature Conservation Sites Systems in Scotland' produced by SNH in association with COSLA (Convention of Scottish Local Authorities). Fifteen sites were identified as of potential relevance to the proposed development, four of which it has been possible to map (Table 10.12 and Figure 10.4). The boundaries for the remaining proposed sites are available online on the Aberdeenshire Council website¹.

Table 10.12: LNCSs considered within the assessment

Site Name	Distance [km]*	Description/Interest Feature(s)
LNCS (Aberdeen City Council)		
Balnagask to Cove	0	Mixed habitats, on a rich substrate supporting herb rich grasslands, wet flushes, coastal heathland, rocky cliffs and rock pools. There are coastal cliffs and caves, shingle beaches, coastal and neutral grassland, European dry heath and coastal heath. There are also areas of gorse scrub. As a result there are interesting coastal plants and associated insects. The rocks by the harbour have pools that provide mini salt-marsh habitats. The site also has a good variety of coastal birds including those that nest on the rocky cliffs, while cetaceans can sometimes be seen out to sea. The site also has geological interest containing andalusite in regionally metamorphosed migmatic rocks. Nigg Bay has a geological SSSI, and the cliffs around Cove, a biological SSSI.
River Dee Corridor	3	The River Dee is a clean, fast flowing river and within Aberdeen supports a diverse range of plants and animals. Along sections of the river bank a strip of semi-natural grassland and water margin vegetation is present. Patches of willow and alder trees occur where grazing is light or absent. The River Dee supports a number of breeding and overwintering birds, with an interesting insect fauna. Shingle beaches in the River Dee provide spawning areas for salmon. The River Dee is also a Special Area of Conservation for the presence of the Atlantic salmon, European otter and Fresh water pearl mussel.
River Don Corridor	5	The River Don is a fast flowing river with a number of weirs along its length forming pools. The river has rich marginal vegetation except where it flows through intensively grazed areas. The steep sided wooded banks of the Lower Don are some of the best in the City. The water quality of the River Don has been a problem in the past but has shown considerable improvement in recent years.
Note: *This is an approximate distance by sea from the proposed development		

¹ https://www.aberdeenshire.gov.uk/planning/plans_policies/LNCSsites1to20.pdf

Table 10.12: LNCSS considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)
Balgownie-Blackdog Links	5.5	This is an extensive coastal site stretching for 5 miles from Bridge of Don to Blackdog. The east half of the site is made up of beach and sand dunes. The variety of habitats on this site supports a diverse range of species. There is interesting insect fauna and a number of wading birds feed along the shoreline while sea ducks can be spotted offshore, particularly in the winter. The beach is very well used by the public for recreation.
Proposed LNCSSs North of Aberdeen (Aberdeenshire LDP 2016)		
Blackdog to Bridge of Don Coast	5.5	Extensive coastal site consisting of coastal sand dunes, grassland, wet and dry heathland, gorse scrub and small patches of planted woodland. The varied habitats contain a diverse range of plant and invertebrate species. The site is of significant ornithological interest with large numbers of sea ducks offshore in the winter and breeding birds within the dunes and grassland. Large numbers of roosting and feeding birds periodically use agricultural fields adjacent to the LNCSS.
Newburgh to Balmedie	9.5	A stretch of sandy coastline between Newburgh and Balmedie with extensive fixed and fore dunes together with dune pasture, marshes and heath. The diverse flora of these areas supports a variety of invertebrates. The Links are well-known for a range of migrant birds and the inshore waters for large moulting and passage flocks of seaduck and divers. Foveran Links is an important part of the Sands of Forvie coastal area to which it is closely linked by a variety of environmental processes.
Cruden Bay	31.5	Sheltered sandy bay with rocky coastline to the north and south. Much of the sand dune grassland is now used as a golf course but the fore dunes and patches of semi-natural vegetation within the golf course support a good diversity of plants. These relatively base rich dunes contain plants such as lesser meadow rue and goats-beard. The dunes support a rich assemblage of invertebrates including the white colon moth which is found here at its northern limit.
Ratray Head to Peterhead	46	Variety of coastal habitats including sand dunes. Good diversity of plant species including several species which are rare in north-east Scotland. Agricultural fields adjacent to the coastline are important for roosting and feeding geese, waders and wildfowl and at times can hold thousands of birds.
Strathbeg to Ratray	57.5	This site includes the Loch of Strathbeg together with surrounding swamp, reedbed, fen, marsh and wet woodland. Loch of Strathbeg is one of the largest coastal freshwater lochs in the UK, and is considered one of the finest examples of a dune-dammed loch. On the coastal side of the loch is a large area of coastal sand dune. Inland, agricultural fields are important for a variety of resident and migrant birds. The site has a good flora and is of significant ornithological importance. The coastal part of the site is of geomorphological interest with a classic raised spit which in its development through varying land-sea relationship has led to the establishment of the loch.
Proposed LNCSSs South of Aberdeen (Aberdeenshire LDP 2016)		
Findon	6.5	Coastal heathland with adjacent maritime cliff and slope make up this site. Good diversity of plants. The sea cliffs are important for breeding colonies of kittiwake and razorbill.
<p>Note: *This is an approximate distance by sea from the proposed development</p>		

Table 10.12: LNCSs considered within the assessment continued

Site Name	Distance [km]*	Description/Interest Feature(s)
Portlethen to Muchalls Coast	9	This coastal site consists of cliffs, coastal grassland, heathland and gorse scrub. These habitats support a good diversity of coastal and heathland plant species and the cliffs are important for nesting birds.
Muchalls to Stonehaven Bay	14	Rocky cliffs and shore with a rich coastal flora. Species associated with base-rich soils are present. Small areas of sand dune, shingle, flush and salt marsh are present along the shoreline. Key site for invertebrates of base rich habitats. The shores around Garron Point/Skatie Shore support diverse populations of marine algae. Rare whorl snail at Garron Point. Outcrop of the Highland Boundary Fault.
Downie Point to Catterline Coast	21.5	This stretch of coastline is particularly important for breeding seabirds with Fowlsheugh containing the largest colony of breeding seabirds in the north-east and one of the largest colonies in mainland Britain. The cliffs to the north of Fowlsheugh, whilst they do not support such high numbers, are still valuable for breeding birds. Good coastal flora with some base rich areas and a good diversity of invertebrates. Blowhole, hanging valley and unusual platform weathering forms present.
Inverbervie to Johnshaven Coast	29.5	Old Red Sandstone has weathered to give a broad wave cut platform with a large intertidal zone which is important for wading birds dependent on the rock shore, and for sea ducks offshore. The rocky cliffs to the north of Inverbervie hold an important colony of breeding cormorants. Locally interesting plants.
St Cyrus	42.5	Extensive coastal site with geological and geomorphological features. Dune, coastal grassland, saltmarsh, maritime grassland and rocky shore. Woodland within the steep dens to the north of the site. Botanically rich.
Note: *This is an approximate distance by sea from the proposed development		

10.4.9.1 Aberdeen City Council LNCSs

Balnagask to Cove LNCS

The site description notes that the site has a good variety of coastal birds including those that nest on the rocky cliffs (Table 10.12). With the exception of the Nigg Bay geological SSSI this LNCS does not overlap with any other designated site and occupies an area of 110.93 ha. The vantage point (VP) surveys undertaken (ES Appendix 14-A: Marine Ornithology Vantage Point Survey Report) have identified a suite of birds for this location with key species assessed in Chapter 14: Marine Ornithology.

The North-east Scotland Biological Records Centre (NESBReC) species distribution maps showed good agreement with the VP surveys (ES Appendix 14-A: Marine Ornithology Vantage Point Survey Report). For example, no sightings of little tern (*Sternula albifrons*) have been recorded for Nigg Bay from either source. Two records of black-throated diver (*Gavia arctica*) from 2008 and 2009 are available from NESBReC but this species was not encountered during the VP surveys. Red-throated diver (*Gavia stellata*) are much more numerous in the area with multiple records at NESBReC and good evidence from the VP survey work with peak counts during the spring and autumn coinciding with the species main migration periods.

River Dee Corridor LNCS

As the site description notes, the River Dee supports a number of breeding and overwintering birds (Table 10.12). This site overlaps with the River Dee SAC and occupies an area of 248.38 ha. A full assessment of bird species which may be effected by the proposed development is presented in Chapter 14: Marine Ornithology.

River Don Corridor LNCS

Sea birds are not referred to in the site description (Table 10.12). The site partially overlaps with Donmouth LNR and as noted for that site it is unlikely that physical processes link the two sites as longshore drift from wave action in the southern section of Aberdeen Bay is southwards (Stapleton and Pethick 1996). This LNCS occupies an area of 299.33 ha and no connectivity between the site and the proposed development has been identified.

Balgownie-Blackdog Links LNCS

As indicated by the site description, a number of wading birds feed along the shoreline here while sea ducks can be spotted offshore, particularly in the winter (Table 10.12). The site overlaps with the Ythan Estuary and Sands of Forvie dSPA and occupies an area of 780.61 ha. The vantage point (VP) surveys undertaken in Nigg Bay (ES Appendix 14-A: Marine Ornithology Vantage Point Survey Report) identified a suite of birds with key species assessed in Chapter 14: Marine Ornithology.

10.4.9.2 Proposed Aberdeenshire Council LNCSs (LDP 2016)

These more distant sites are currently proposed as part of the next iteration of the LDP, which is to be published and formally adopted in early 2017. Development proposals will be required to accord with the LDP from the date of its adoption. No effects on the habitats associated with the sites are predicted (in line with previous assessments for the statutory sites within this chapter). Where birds are an important feature of these proposed LNCSs, a similar assessment process as applied to SPAs has been used to identify any potential connectivity. In addition to data available online from NESBReC/NBN Gateway, the nearest designated sites with species listed have been used to help make an assessment in conjunction with any seabird data obtained for the ornithological assessment.

Blackdog to Bridge of Don Coast Proposed LNCS

This site is noted for significant ornithological interest, in particular with large numbers of sea-ducks offshore in the winter. JNCC data indicates that large numbers of eider have been observed within the boundaries of this site (see Chapter 14: Marine Ornithology).

The site overlaps partially with the Donmouth LNR and, more significantly, falls within the dSPA Ythan Estuary and Sands of Forvie (see Section 10.4.3.10). The dSPA qualifying species are sandwich and little terns. These two species have foraging ranges which indicate potential connectivity with the proposed development; however, the latter were not recorded during the VP survey work (ES Appendix 14-A: Marine Ornithology Vantage Point Survey Report).

Each of these species has been assessed within Chapter 14: Marine Ornithology.

Newburgh to Balmedie Proposed LNCS

The description indicates that the links within the site are well known for a range of migrant birds and the inshore waters for large moulting and passage flocks of sea-duck and divers (Table 10.12). This site overlaps with the Foveran Links SSSI and the Ythan Estuary and Sands of Forvie dSPA. Furthermore, it is adjacent to the Ythan Estuary, Sands of Forvie and Meikle Loch SPA, Ythan Estuary and Meikle Loch Ramsar, Sands of Forvie and Ythan Estuary SSSI and Forvie NNR.

JNCC data indicates large numbers of eider have been observed within the boundaries of this site (Chapter 14: Marine Ornithology).

Connectivity between the site and the proposed development is implied, in particular, by the foraging ranges for sandwich tern, pink-footed goose and eider (see Section 10.4.3.1). Relevant assessments of the birds in question are provided within the Chapter 14: Marine Ornithology.

Cruden Bay Proposed LNCS

Sea birds are not noted in the description for this proposed LNCS (Table 10.12). However, the site overlaps with Bullers of Buchan Coast SSSI (see Section 10.4.5.16) and Buchan Ness to Collieston SPA (see Section 10.4.3.2).

JNCC data indicates that large numbers of eider have been observed within the boundaries of this site (see Chapter 14: Marine Ornithology).

Based on the JNCC eider data and the Buchan Ness to Collieston Coast SPA, connectivity between the site and the proposed development is implied by the foraging ranges for eider, guillemot, kittiwake, fulmar, shag and herring gull (see Section 10.4.3.2). Relevant assessments are available in Chapter 14: Marine Ornithology Chapter and Volume 4: HRA.

Ratray Head to Peterhead Proposed LNCS

Agricultural fields adjacent to the coastline are important for roosting and feeding geese, waders and wildfowl and at times can hold thousands of birds (Table 10.12).

No other sites overlap with this proposed LNCS. The Loch of Strathbeg SSSI is adjacent to the site (see Section 10.4.5.17). None of the bird species for which the SSSI was notified have foraging ranges which would indicate connectivity to the area of the proposed development; but as indicated for the SPA (see Section 10.4.3.3) any relevant assessments are available in the Chapter 14: Marine Ornithology and Volume 4: HRA.

Strathbeg to Ratray Proposed LNCS

The description notes that the fields are important for resident and migrant birds (Table 10.12). The Loch of Strathbeg overlaps with the SSSI, SPA and Ramsar site of the same name.

With the possible exception of Sandwich tern, none of the bird species for which this site has been designated have foraging ranges which would indicate connectivity to the area of the proposed development.

Findon Proposed LNCS

The sea cliffs at this site are noted as being important for breeding colonies of kittiwake and razorbill (Table 10.12). The site overlaps with Findon Moor SSSI.

Both kittiwake and razorbill have foraging ranges which indicate possible connectivity to the proposed development. Relevant bird assessments are provided within Chapter 14: Marine Ornithology.

Portlethen to Muchalls Coast Proposed LNCS

The description for the site notes that the cliffs are important for nesting birds (Table 10.12). No other site designations exist in this area.

In the absence of any site specific data and given the close geographical proximity to the Findon LNCS, if it is assumed that kittiwake and razorbill also occupy this area then possible connectivity to the proposed development exists. Relevant bird assessments are provided within Chapter 14: Marine Ornithology.

Muchalls to Stonehaven Bay Proposed LNCS

Birds species are not specifically referred to in the site description (Table 10.12).

Fowlsheugh is the closest SPA occurring just to the south of the proposed LNCS (see Section 10.4.3.5). Assuming the presence of similar bird species then connectivity between the site and the proposed development is implied by the foraging ranges for guillemot, kittiwake, razorbill, fulmar and herring gull. Relevant bird assessments are provided within the Chapter 14,: Marine Ornithology.

Downie Point to Catterline Coast Proposed LNCS

This site overlaps with Fowlsheugh SPA (see Section 10.4.3.5) and SSSI (see Section 10.4.5.1) and is therefore particularly important for breeding seabirds containing the largest colony in the north-east and one of the largest colonies in mainland Britain (Table 10.12).

Connectivity between the site and the proposed development is implied by the foraging ranges for guillemot, kittiwake, razorbill, fulmar and herring gull. Relevant assessments are available in Chapter 14: Marine Ornithology and Volume 4: HRA.

Inverbervie to Johnshaven Coast Proposed LNCS

The description notes that this site is important for wading birds dependent on the rock shore, and for sea ducks offshore. The rocky cliffs to the north of Inverbervie hold an important colony of breeding cormorants. No other site designations exist in this area.

Connectivity between the site and the proposed development is implied by the foraging range for cormorant. Relevant bird assessments are provided within the Chapter 14: Marine Ornithology.

St Cyrus Proposed LNCS

Sea birds are not mentioned in the site description. The site overlaps with the St Cyrus and Kinnaber Links SSSI (see Section 10.4.5.3) and the St Cyrus NNR (see Section 10.4.7.2). No connectivity between the habitats listed in the description and the proposed development is suggested given the relatively large intervening distance.

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