



Port of Cromarty Firth Quay West Maintenance Dredge Licence Habitat Regulation Assessment Screening Supporting Document



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| Author | Ffion Maguire | Environmental Consultant | [Redacted] | 27/11/2023 |
| Reviewer | Sonja Brown | Principal Consultant | | 04/12/2023 |
| Authoriser | Fiona Henderson | Managing Director | | 04/12/2023 |

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1 Introduction

The Port of Cromarty Firth (PoCF) are in the process of applying for a dredging licence to undertake maintenance dredging works immediately south of Quay West 1 & 2 (also known as Berths 5 and 6) at the Invergordon Service Base (ISB). The dredging works are required to remove some high spots to ensure the berth depth of -12m Chart Datum (CD) is maintained, to allow access by large vessels supporting offshore wind projects.

A Habitat Regulation Appraisal (HRA) is required when a project has potential to cause adverse effects to any European Site, which include Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). The ISB is situated immediately adjacent to the Cromarty Firth SPA. Hence, the potential for works associated with the ISB to impact upon the Cromarty Firth SPA, and any other European Site within the wider locality must be considered.

This HRA Screening Supporting Document has been produced in support of the dredging works proposed to the south of the ISB. In particular, this HRA Screening Supporting Document provides the information required for the competent authority (Marine Directorate) to carry out an HRA.

The document provides reference to in-depth ornithological surveys that have been overtaken at the ISB and adjacent shoreline over several years. Winter bird surveys were completed in 2015/16, 2017/18, 2020/21 and 2022/23 (see Table A1.1). Breeding bird surveys for common eider, common tern and arctic tern were undertaken in 2016 and 2017 (Swann & Brockway, 2016; and Swann & Brockway, 2017). Whilst a breeding bird survey for all bird species was undertaken in 2022 and 2023 (Atmos Consulting (Atmos) 2022; and Atmos, 2023). The results of these studies show extensive knowledge of the ornithological nature of the ISB and adjacent shoreline in support of the justifications throughout this document.

2 Objectives

The objectives of this HRA Screening Supporting Document are to:

- Outline the details of the proposed dredging works;
- Consider whether there is any potential ecological connectivity between qualifying interests associated with European Sites;
- Identify whether there are any Likely Significant Effects (LSEs) to any qualifying interests with potential ecological connectivity to the proposed works area, with consideration of the site's conservation interests; and
- Provide the Marine Directorate with suitable information to carry out an HRA.

3 Legislative Context

3.1 Legislation

Articles 6(3) and 6(4) of the Habitats Directive (92/43/EEC) are implemented in Scotland through The Conservation (Natural Habitats, &c Regulations 1994 (as amended) (hereafter referred to as the 'Habitats Regulations'). As a result of the United Kingdom (UK) leaving the European Union (EU), the Habitats Regulations were amended in Scotland, in 2019. The Habitats Regulations remain in force, including the provisions for the protection of European Sites.

The above legislation determines that, if a plan or project could affect a European Site there are certain considerations that must be made before the proposal can proceed. In particular, Regulation 48 of the Habitats Regulations dictates that any plan or project, which may result in a Likely Significant Effect (LSE) on any qualifying interests associated with a European Site (either alone or in combination with other plans or projects) and is not directly connected with or necessary to the management of the site, shall be subject to an appropriate Assessment (AA). The AA must demonstrate that the proposal will not adversely affect the integrity of the site.

It is the responsibility of the competent authority to carry out the HRA based on robust, scientific information provided by the project developer. It is not the role of the developer to make an assessment on whether the proposal will have an adverse effect on any qualifying interests associated with European Sites. If no LSE is anticipated, it is likely that an AA will not be required.

3.2 Terminology

3.2.1 European Site

In Scotland, European Sites include SPAs and SACs, 'candidate' Special Areas of Conservation (cSACs) and proposed SPAs (pSPAs) and SACs (pSACs) which have been approved by Scottish Ministers for formal consultation. The parts of SPAs, SACs, cSACs, pSPAs and pSACs which lie below Mean High Water Springs (MHWS) tidal height are also referred to as 'European Marine Sites', and those in the offshore marine area are also called 'European Offshore Marine Sites' (EOMS).

3.2.2 Ramsar Site

A Ramsar site is a site listed as a wetland of international importance under the provisions of the 'Ramsar Convention'. In Scotland, all Ramsar sites are also European Sites and/or Sites of Special Scientific Interest (SSSI). Thus, are protected under the relevant statutory regimes. Where Ramsar interests coincide with European Sites, the qualifying interests are protected under an SPA or SAC. Therefore, the qualifying interest is directly associated with that of a European Site and is given the same level of legal protection and does not need to be considered independently within the HRA process. Where the qualifying interests of a Ramsar site are not the same as European Site, but instead match SSSI qualifying interests, they receive protection under the SSSI regime. Hence, Ramsar sites are not pertinent to the requirements for an HRA.

3.2.3 Likely Significant Effect

The terminology employed as part of the HRA process is very specific, and in some instances the words have a meaning distinct to that in common usage. In particular, there is a distinction between the usage of 'LSE' and 'adverse effects on site integrity'.

In this HRA Screening Supporting Document, the use of 'LSE' refers to the potential for adverse effects on site integrity in the absence of mitigation.

A project component is identified to result in an LSE if there is potential ecological connectivity between a qualifying interest associated with a European Site and the proposed works area, and the proposed works are anticipated to have an impact upon the conservation objectives of the European Site in the absence of mitigation. As such, the conservation objectives of the

site provide the framework for considering the potential for LSEs. Where an LSE “cannot be excluded, on the basis of objective information” (European Court of Justice, 2004), or without the use of mitigation, an AA is required.

4 Proposed Activity

PoCF have proposed to undertake maintenance dredging works at Quay West 1 & 2, within an area below MHWS, immediately adjacent to the existing port infrastructure (southwards). The design depths of the berths are -12m CD however, recent bathymetry has identified high spots of up to -11.3m CD. It is proposed that plough dredging is completed to drag material from the high spots into adjacent areas with depths of greater than -12m CD. Thereby smoothing out the seabed to ensure the designed depth is maintained throughout the berthing area. The technique utilized does not require sediments to be removed from the seabed, hence there is no dredge spoil requiring disposal.

The intent is to carry out the plough dredging works at the earliest opportunity; as such, on the basis that the appropriate approvals will be in place in time, works will be carried out in the winter (prior to the end of March 2024). The area is relatively small and hence works should be completed in a matter of days (< 1 week).

It is recognised that the proposed dredging activity is not directly connected with, or necessary to, the site management for nature conservation of any European Site.

5 Overview of HRA Screening

In order to determine whether there is potential for ecological connectivity between the proposed plough dredge works and any qualifying interests associated with European Sites, the dredging methodology, the location of European Sites and the ecology of each individual qualifying interest has been considered. Where potential ecological connectivity has been identified, the qualifying interest has been further assessed to determine whether there may be a LSE in the absence of mitigation. The assessment for LSE has been considered in line with the conservation objectives of the European Site.

Table 5.1 provides an overview of the European Sites that have been considered and whether the associated qualifying interests have potential ecological connectivity. The justification for absence of potential ecological connectivity is described in Section 6. Those qualifying interests taken forward for LSE screening due to potential ecological connectivity are considered further in Section 7.

In addition, Table 5.1 identifies the distance and direction of each European Site to the proposed works area. It is noted however, that for aquatic species it is more appropriate to consider the distance within the marine environment. Hence, distances within justifications for ecological connectivity discussed in Sections 6 and 7 may differ from those detailed within Table 5.1.

Table 5.1: European Sites Considered for HRA Screening and Overview of Potential Ecological Connectivity

| European Site | Approximate Distance and Direction from the Proposed Dredging Works | Qualifying interest(s) | Potential Ecological Connectivity Identified |
|--------------------|---|---|--|
| Cromarty Firth SPA | <100 metres (m) north | <p>Breeding: Osprey (<i>Pandion haliaetus</i>); and Common tern (<i>Sterna hirundo</i>); and</p> <p>Non-breeding: Whooper swan (<i>Cygnus cygnus</i>); Bar-tailed godwit (<i>Limosa lapponica</i>); Greylag goose (<i>Anser anser</i>); Redshank (<i>Tringa tetanus</i>); Curlew (<i>Numenius arquata</i>); Knot (<i>Calidris canutus</i>); Red-breasted merganser (<i>Mergus serrator</i>); Scaup (<i>Aythya marila</i>); Pintail (<i>Anas acuta</i>); Wigeon (<i>Anas Penelope</i>); Dunlin (<i>Calidris alpina</i>); Oystercatcher (<i>Haematopus ostralegus</i>); and Waterbird Assemblage.</p> | Yes |
| Moray Firth SAC | 6 kilometres (km) east | Bottlenose dolphin (<i>Tursiops truncatus</i>). | Yes |
| | | Subtidal sandbanks. | No |
| Moray Firth SPA | 11km east | <p>Breeding: European shag (<i>Phalacrocorax aristotelis</i>); and</p> <p>Non-breeding: Common eider (<i>Somateria mollissima</i>); Common goldeneye (<i>Bucephala clangula</i>); and Red-breasted merganser.</p> <p>Non-breeding: Great northern diver (<i>Gavia immer</i>); Red-throated diver (<i>Gavia stellata</i>); Slavonian grebe (<i>Podiceps auratus</i>); Scaup; Long-tailed duck (<i>Clangula hyemalis</i>); Common scoter (<i>Melanitta nigra</i>); and Velvet scoter (<i>Melanitta fusca</i>).</p> | Yes |
| | | | No |

| European Site | Approximate Distance and Direction from the Proposed Dredging Works | Qualifying interest(s) | Potential Ecological Connectivity Identified |
|----------------------------------|---|---|--|
| Inner Moray Firth SPA | 15km south south-west | <p>Breeding: Common tern; and</p> <p>Non-breeding: Bar-tailed godwit; Greylag goose; Red-breasted merganser; Redshank; Curlew; Goosander (<i>Mergus merganser</i>); Common goldeneye; Wigeon; Cormorant (<i>Phalacrocorax carbo</i>); Oystercatcher; and Waterbird assemblage</p> | Yes |
| | | <p>Breeding: Osprey; and</p> <p>Non-breeding: Scaup; and Teal (<i>Anas crecca</i>).</p> | No |
| Loch Eye SPA | 16km northeast | <p>Non-breeding: Greylag goose.</p> | Yes |
| | | <p>Non-breeding: Whooper swan.</p> | No |
| Dornoch Firth and Loch Fleet SPA | 16km north northeast | <p>Non-breeding: Bar-tailed godwit; Greylag goose; Wigeon; Curlew; Redshank; Dunlin; Oystercatcher; and Waterbird assemblage.</p> | Yes |

| European Site | Approximate Distance and Direction from the Proposed Dredging Works | Qualifying interest(s) | Potential Ecological Connectivity Identified |
|------------------------------------|---|---|--|
| | | <p>Breeding: Osprey; and</p> <p>Non-breeding: Teal; and Scaup.</p> | No |
| Dornoch Firth and Morrich More SAC | 16km north northeast | Common seal (<i>Phoca vitulina</i>). | Yes |
| | | Coastal dune heathland; Atlantic salt meadows; Dunes with juniper thickets; Lime-deficient dune heathland with crowberry; Shifting dunes; Estuaries; Dune grassland; Humid dune slacks; Otter (<i>Lutra lutra</i>); Intertidal mudflats and sandflats; Reefs; Glasswort and other annuals colonising mud and sand; Subtidal sandbanks; and Shifting dunes with marram. | No |
| River Oykel SAC | 25km northwest | Freshwater pearl mussel (<i>Margaritifera margaritifera</i>); and Atlantic salmon (<i>Salmo salar</i>). | No |
| River Spey SAC | 48km southeast | Otter; Freshwater pearl mussel; and Atlantic salmon. | No |
| | | Sea lamprey (<i>Petromyzon marinus</i>). | Yes |
| River Moriston SAC | 58km southwest | Freshwater pearl mussel; and Atlantic salmon. | No |
| Berriedale and Langwell Waters SAC | 65km northeast | Atlantic salmon. | No |

| European Site | Approximate Distance and Direction from the Proposed Dredging Works | Qualifying interest(s) | Potential Ecological Connectivity Identified |
|-----------------------------------|---|--|--|
| Firth of Tay and Eden Estuary SAC | 153km southeast | Estuaries; Intertidal mudflats and sandflats; Common seal; and Subtidal sandbanks. | No |
| Farey and Holm or Farey SAC | 186km northeast | Grey seal (<i>Halichoerus grypus</i>). | No |

6 Exclusions due to Absence of Ecological Connectivity

Prior to assessment for LSE, each qualifying interest was considered independently to determine whether there was potential ecological connectivity to the proposed plough dredging works. Where no potential ecological connectivity was identified, the qualifying interest was screened out from further assessment. Justification for the lack of potential ecological connectivity is described within this section.

Please note that, where potential ecological connectivity between a qualifying interest and the proposed works has been identified, the qualifying interest and justification is not detailed within Section 6. Instead, please refer to Section 7 'Screening for Likely Significant Effect'.

6.1 Moray Firth SAC

6.1.1 Habitats

The Moray Firth SAC supports an Annex I habitat, subtidal sandbanks (i.e., sandbanks which are slightly covered by sea water all the time) (Joint Nature Conservation Committee (JNCC), 2023e).

Sedimentation associated with plough dredging is extremely localised, as sediments are dragged along the seabed and are not lifted, hence they do not readily enter the upper reaches of the water column. The closest sandbanks to the proposed works area are situated approximately 6.25 kilometres (km) away (within the marine environment), within Cromarty Bay. Thus, sediments are highly unlikely to reach the qualifying interest and cause any disturbance or degradation. Therefore, there is considered to be **no ecological connectivity, and the qualifying interest 'subtidal sandbanks associated with the Moray Firth SAC', is excluded from further assessment.**

6.2 Moray Firth SPA

6.2.1 Ornithology

The Moray Firth SPA qualifies under Article 4.1 by regularly supporting a non-breeding population of European importance of Annex 1 species. This includes great northern diver (*Gavia immer*) (a mean peak annual non-breeding population of 144 individuals (5.8% of the Great Britain (GB) population) for the years 2001/02-2006/07), red-throated diver (*Gavia stellata*) (a mean peak annual non-breeding population of 324 individuals (1.9% of the GB population) for the years 2001/02-2006/07) and Slavonian grebe (*Podiceps auritus*) (a mean

peak annual non-breeding population of 43 individuals (3.9% of the GB population) for the years 2001/02-2005/06) (Scottish Natural Heritage (SNH) (now NatureScot), 2018e).

The site further qualifies under Article 4.2 by regularly supporting populations of European importance of migratory species. Including scaup (*Aythya marila*) (a mean peak annual non-breeding population of 930 individuals (17.9% of the GB population) for the years 2001/02 to 2005/06), long-tailed duck (*Clangula hyemalis*) (a mean peak annual non-breeding population of 5,001 individuals (45.5% of the GB population) for the years of 2001/02 to 2005/6), common scoter (*Melanitta nigra*) (a mean peak annual non-breeding population of 5,479 individuals (5.5% of the GB population) for the years 2001/02 to 2005/06) and velvet scoter (*Melanitta fusca*) (a mean peak annual non-breeding population of 1,488 individuals (59.5% of the GB population) for the years 2001/02 to 2005/06) (SNH, 2018e).

Winter bird surveys of the shoreline adjacent to the ISB were undertaken in 2015/16, 2017/18, 2020/21 and 2022/23. No records of great northern diver, red-throated diver, Slavonian grebe, scaup, long-tailed duck, common scoter or velvet scoter were recorded during any of the winter bird surveys (see Table A1.1). In addition, none of these species were recorded during either of the breeding bird surveys in 2022 and 2023 (Atmos, 2022; and Atmos 2023). Therefore, it would be considered justifiable to assume that none of the seven ornithological species listed from the Moray Firth SPA utilise habitats within close proximity to the ISB. As such, there is considered **no ecological connectivity, and the qualifying interests 'great northern diver, red-throated diver, Slavonian grebe, scaup, long-tailed duck, common scoter and velvet scoter associated with the Moray Firth SPA', are excluded from further assessment.**

6.3 Inner Moray Firth SPA

6.3.1 Ornithology

The Inner Moray Firth SPA qualifies under Article 4.1 by regularly supporting populations of European importance of Annex 1 species. Including osprey (*Pandion haliaetus*), which forage throughout the SPA (2008 to 2012, up to 25 territories within feeding range of the SPA, 12.5% of the GB population, with 4 pairs breeding within the site, 4% of the GB population) (SNH 2018c).

The Inner Moray Firth SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. Between 1992/93 to 1996/97 a winter peak mean of 26,800 individual waterfowl comprising 16,800 wildfowl and 10,000 waders including nationally important populations of scaup (118 individuals, 1% of the GB population) and teal (*Anas crecca*) (2,066 individuals, 1% of the GB population) (SNH 2018c).

Osprey generally forage up to 10km of the nest (Hardey *et al.*, 2013). The Inner Moray Firth SPA is situated approximately 13km southeast and 15km south south-west of the ISB and proposed area of dredging works respectively. Therefore, it would be considered justifiable to assume that osprey breeding within the SPA do not utilise habitats within close proximity to the proposed works area to forage. Furthermore, there are no known records of osprey within 10km of the proposed works area (National Biodiversity Network (NBN), 2023). Therefore, there is considered to be **no ecological connectivity, and the qualifying interest 'osprey associated with the Inner Moray Firth SPA', is excluded from further assessment.**

Winter bird surveys of the shoreline adjacent to the ISB were undertaken in 2015/16, 2017/18, 2020/21 and 2022/23. No records of scaup or teal were recorded during any of the winter bird surveys (see Table A1.1). In addition, none of these species were recorded during the breeding bird surveys undertaken in 2022 and 2023 (Atmos, 2022; and Atmos 2023). Therefore, it would be considered justifiable to assume that neither scaup nor teal from the Inner Moray Firth SPA utilise habitats within close proximity to the ISB. As such, there is considered to be **no ecological connectivity, and the qualifying interests 'scaup and teal associated with the Inner Moray Firth SPA', are excluded from further assessment.**

6.4 Loch Eye SPA

6.4.1 Ornithology

The Loch Eye SPA qualifies under Article 4.1 by regularly supporting a population of European importance of Annex 1 species. Including whooper swan (*Cygnus cygnus*) (140 individuals, over 1% of the GB population) (SNH, 2018d).

Winter bird surveys of the shoreline adjacent to the ISB were undertaken in 2015/16, 2017/18, 2020/21 and 2022/23. No records of whooper swan were recorded during any of the winter bird surveys (see Table A1.1). In addition, no whooper swan were recorded during the breeding bird surveys undertaken in 2022 and 2023 (Atmos, 2022; and Atmos, 2023). Therefore, it would be considered justifiable to assume that whooper swan from the Loch Eye SPA do not utilise habitats within close proximity to the ISB and the proposed area of dredging works. As such, there is considered to be **no ecological connectivity, and the qualifying interest 'whooper swan associated with the Loch Eye SPA' is excluded from further assessment.**

6.5 Dornoch Firth and Loch Fleet SPA

6.5.1 Ornithology

The Dornoch Firth and Loch Fleet SPA qualifies under Article 4.1 by regularly supporting populations of European importance of Annex 1 species. Including osprey, which forage throughout the SPA (up to six territories within feeding range of the SPA, 6% of the GB population, with 1 pair breeding within the site, 1% of the GB population) (SNH, 2018b).

Dornoch Firth and Loch Fleet SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. In the five-year period 1989/90 to 1993/94, a winter peak mean of approximately 34,500 individual waterfowl was recorded, comprising 22,000 wildfowl and 12,500 waders, including nationally important populations of teal (1,592 individuals, 1.0% of the GB population) and scaup (123 individuals, 1% of the GB population) (SNH, 2018b).

Osprey generally forage up to 10km of the nest (Hardey, *et al.*, 2013). The Dornoch Firth and Loch Fleet SPA is situated approximately 16km northeast of the ISB and proposed area of dredging works. Therefore, it would be considered justifiable to assume that osprey breeding within the SPA do not utilise habitats within close proximity to the proposed works area to forage. Furthermore, there are no known records of osprey within 10km of the proposed works area (NBN, 2023). Thus, it would be considered justifiable to assume that there is **no ecological connectivity, and the qualifying interest 'osprey associated with the Dornoch Firth and Loch Fleet SPA', is excluded from further assessment.**

Winter bird surveys of the shoreline adjacent to the ISB were undertaken in 2015/16, 2017/18, 2020/21 and 2022/23. No records of teal or scaup were recorded during any of the winter bird surveys (see Table A1.1). In addition, none of these species were recorded during the breeding bird surveys undertaken in 2022 and 2023 (Atmos, 2022; and Atmos 2023). Therefore, it would be considered justifiable to assume that neither teal or scaup from the Dornoch Firth and Loch Fleet SPA utilise habitats within close proximity to the ISB. As such, there is considered to be **no ecological connectivity, and the qualifying interests 'teal and scaup associated with the Dornoch Firth and Loch Fleet SPA', are excluded from further assessment.**

6.6 Dornoch Firth and Morrich More SAC

6.6.1 Habitats

The Dornoch Firth and Morrich More SAC supports, several Annex I habitats. Including coastal dune heathland, Atlantic salt meadows, dunes with juniper (*Juniperus* sp.) thickets, lime-deficient dune heathland with crowberry (*Empetrum* sp.), shifting dunes, estuaries, dune grassland, humid dune slacks, intertidal mudflats and sandflats, reefs, glasswort (*Salicornia* spp.) and other annuals colonising mud and sand subtidal sandbanks and shifting dunes with marram (*Ammophila* spp.) (JNCC, 2023b).

The Dornoch Firth is the most northerly large estuary in the UK. The estuary is fed by the Kyle of Sutherland and is largely unaffected by industrial development. Within the estuary, there is a complete transition from riverine habitats to full marine conditions and associated ecosystems. The estuary contains extensive areas of mudflats and sandflats. The flats extend along the northern and southern shores and are characteristic of a range of environmental conditions. There is a continuous gradient in the physical structure of the flats, from medium-sand beaches on the open coast to stable, fine-sediment mudflats and muddy sands further inland. This results in a high species diversity. The sheltered bays provide a habitat for communities of algae, eelgrass (*Zostera* spp.) and the pioneer saltmarsh plant glasswort. Areas of the site have been designated for the presence of glasswort and other annuals that colonise in mud and sand. Furthermore, the site has been selected for Atlantic salt meadows. The site is the most northerly site selected for these habitat types, representing both habitats in the northern part of their range in the UK. In addition, the Dornoch Firth and Morrich More SAC supports a large dune system, which is physically diverse, supporting several dune structures. Including, embryonic shifting dunes, shifting dunes along the shoreline with *Annophila arenaria* (white dunes), fixed coastal dunes with herbaceous vegetation (grey dunes), decalcified fixed dunes with *Empetrum nigrum*, Atlantic decalcified fixed dunes with *Callunovicetia*, humid dune slacks and coastal dunes with juniper species (JNCC, 2023b).

Each of the qualifying interests listed above are habitats and hence are immobile features. When considering the distance within the marine environment, there is approximately 43km around the coastline between The Dornoch Firth and Morrich More SAC and the ISB and proposed works area. Disturbance and sedimentation associated with dredging will be extremely localised. Therefore, it is considered unlikely that the proposed works would cause any disturbance that would encroach upon any marine habitats within the Dornoch Firth. Furthermore, no terrestrial habitats are expected to be affected. Therefore, there is considered to be **no ecological connectivity, and the qualifying interests 'coastal dune heathland, Atlantic salt meadows, dunes with juniper thickets, lime-deficient dune heathland with crowberry, shifting dunes, estuaries, dune grassland, humid dune slacks, intertidal**

mudflats and sandflats, reefs, glasswort and annuals colonising mud and sand, subtidal sandbanks and shifting dunes with marram associated with the Dornoch Firth and Morrich More SAC, are excluded from further assessment.

6.6.2 Otter

The Dornoch Firth and Morrich More SAC qualifies by supporting an Annex II species, otter (*Lutra lutra*).

The Dornoch Firth and Morrich More consists of an estuarine system with extensive areas of bordering natural habitat including sand dune, woodland and small lochans. The River Evelix and the River Oykel, which both feed into the site, provide further otter habitat. The area supports a good population of otters in what is the only east coast estuarine site selected for the species in Scotland (JNCC, 2023b).

Otter are a mobile species with extensive home ranges. In a coastal environment, otter generally range between 2-10km (Chanin, 2013). However, in order to reach the ISB and the proposed works area from the Dornoch Firth and Morrich More SAC, otter would need to travel approximately ≥ 43 km within the marine environment. Therefore, it is considered unlikely that otter would range between the SAC and the proposed works area. Hence, there is considered to be **no ecological connectivity, and the qualifying interest 'otter associated with the Dornoch Firth and Morrich More SAC, is excluded from further assessment.**

6.7 River Oykel SAC

6.7.1 Atlantic Salmon

The River Oykel SAC supports an Annex II species, Atlantic salmon (*Salmo salar*) (JNCC, 2023g).

The River Oykel flows into the Kyle of Sutherland, which meets the Dornoch Firth in Bonar Bridge, approximately 74km through the marine environment from the proposed works area. Salmon are habitual, returning to the same river each year (Mills, 1985). Thus, it is considered unlikely that Atlantic salmon from the River Oykel SAC would migrate through the Cromarty Firth. Therefore, there is considered to be **no ecological connectivity and the qualifying interest 'Atlantic salmon associated with the River Oykel SAC, is excluded from further assessment.**

6.7.2 Freshwater Pearl Mussel

The River Oykel supports a population of freshwater pearl mussel (*Margaritifera margaritifera*), with high densities recorded at some locations along the river (including a population of several thousand individuals). Surveys of the river have recorded high percentages of juveniles within the population, which indicates that there has been recent successful recruitment. In addition, there is evidence of pearl mussel populations in deep water (JNCC, 2023g).

The larval phase of freshwater pearl mussels, and therefore successful recruitment, is reliant on the integrity of the salmon population (Taeubert & Geist, 2017). Thus, impacts on this phase of the pearl mussel life cycle are directly correlated to impacts on Atlantic salmon and there is no need to consider this aspect separately (see Section 6.7.1).

Disturbance and sedimentation associated with dredging will be extremely localised. When considering the distance within the marine environment, there is approximately 74km between the River Oykel SAC and the proposed works area. Therefore, it is considered unlikely that the

proposed works would cause any disturbance or degradation of aquatic habitats associated within the River Oykel. Thus, no disturbance to freshwater pearl mussel within the River Oykel is anticipated.

Therefore, there is considered to be **no ecological connectivity, and the qualifying interest 'freshwater pearl mussel associated with the River Oykel SAC', is excluded from further assessment.**

6.8 River Spey SAC

6.8.1 Otter

The River Spey is an important site for otter due to the good quality freshwater habitat. Surveys have identified high levels of otter presence throughout the River Spey catchment area. Riverine habitat features known to be important to otters are present. Including reedbeds, islands and healthy populations of important prey species. The persistence of a strong population of otter on this river indicates that habitat conditions are particularly favourable for the species (JNCC, 2023h).

Otter are a mobile species with extensive home ranges. In a coastal environment, otter generally range between 2-10km (Chanin, 2013). However, in order to reach the proposed works area from the River Spey SAC, otter would need to travel approximately ≥ 66 km within the marine environment. Therefore, it is considered unlikely that otter would range between the SAC and the proposed works area. Hence, there is considered **no ecological connectivity, and the qualifying interest 'otter associated with the River Spey SAC', is excluded from further assessment.**

6.8.2 Atlantic Salmon

The River Spey supports one of the largest populations of Atlantic salmon in Scotland, with little evidence of modification caused by non-native stocks. Adults spawn throughout virtually the entire length of the river, and there is an abundance of high-quality nursery habitat in the main river and numerous tributaries. There are minimal constraints to migration and the river is oligotrophic throughout the entirety of its length. For a water system of its size, the River Spey is also relatively free from flow modifications such as abstractions, diversions and impoundments. The salmon population includes Atlantic salmon of all ages, including migrating smolts and returning adults (JNCC, 2023h).

The mouth of the River Spey is situated in Spey Bay, approximately 65km (within the marine environment) from the proposed works area. Here the river connects to the North Sea, providing a suitable migratory route for Atlantic salmon. Salmon are habitual, returning to the same river each year (Mills, 1985). Thus, it is considered unlikely that Atlantic salmon from the River Spey would bypass the mouth of the river and travel into the Cromarty Firth. Therefore, there is considered to be **no ecological connectivity, and the qualifying interest 'Atlantic salmon associated with the River Spey SAC', is excluded from further assessment.**

6.8.3 Freshwater Pearl Mussel

The River Spey SAC also qualifies by supporting freshwater pearl mussel (JNCC, 2023h).

The River Spey is a large river situated on the east coast of Scotland. The river drains an extensive upland catchment and supports an outstanding population of freshwater pearl.

Extremely dense mussel colonies have been recorded in parts of the River Spey and the total population is estimated at several million. The population also shows recent recruitment and a high proportion of juveniles. Thus, the River Spey is considered to support a pearl mussel population of great international significance (JNCC, 2023h).

The larval phase of freshwater pearl mussels, and therefore successful recruitment, is reliant on the integrity of the salmon population (Taeubert & Geist, 2017). Thus, impacts on this phase of the pearl mussel life cycle are directly correlated to impacts on Atlantic salmon and there is no need to consider this aspect separately (see Section 6.8.2).

Disturbance and sedimentation associated with dredging will be extremely localised. When considering the distance within the marine environment, there is approximately 65km between the River Spey SAC and the ISB and proposed area of dredging works. Therefore, it is considered unlikely that the proposed dredging works would cause any disturbance or degradation of aquatic habitats associated within the River Spey.

Therefore, there is considered to be **no ecological connectivity, and the qualifying interest (freshwater pearl mussel associated with the River Spey SAC) is excluded from further assessment.**

6.9 River Moriston SAC

6.9.1 Atlantic Salmon

The River Moriston SAC qualifies by supporting an Annex II species, Atlantic salmon (JNCC, 2023f).

The River Moriston flows into Loch Ness, which then flows into Loch Dochfour and the River Ness, before reaching the Beaulay Firth in Inverness, approximately 80km (within the marine environment) from the proposed works area. Salmon are habitual, returning to the same river each year (Mills, 1985). Thus, it is considered highly unlikely that Atlantic salmon from the River Moriston would enter the Cromarty Firth to spawn within a different river. Therefore, there is considered to be **no ecological connectivity, and the qualifying interest 'Atlantic salmon associated with the River Moriston SAC', is excluded from further assessment.**

6.9.2 Freshwater Pearl Mussel

The River Moriston flows into the northern side of Loch Ness and supports a population of freshwater pearl mussel. Freshwater pearl mussels are present from downstream of a hydroelectric dam to the convergence with Loch Ness. Due to illegal pearl-fishing, the population is not abundant. However, survey results show that 40% of the population is composed of juveniles. This is the highest percentage recorded in any Scottish pearl mussel population and indicates that recent successful recruitment has taken place (JNCC, 2023f).

The larval phase of freshwater pearl mussels, and therefore successful recruitment, is reliant on the integrity of the salmon population (Taeubert & Geist, 2017). Thus, impacts on this phase of the pearl mussel life cycle are directly correlated to impacts on Atlantic salmon and there is no need to consider this aspect separately (see Section 6.9.1).

Disturbance and sedimentation associated with dredging will be extremely localised. When considering the distance within the marine environment, there is approximately 80km between the River Moriston SAC and the proposed works area. Therefore, it is considered unlikely that

the proposed dredging works would cause any disturbance or degradation of aquatic habitats associated within the River Moriston. Thus, no disturbance to freshwater pearl mussel within the River Moriston is anticipated.

Therefore, there is considered to be **no ecological connectivity, and the qualifying interest 'freshwater pearl mussel associated with the River Moriston SAC', is excluded from further assessment.**

6.10 Berriedale and Langwell Waters SAC

6.10.1 Atlantic Salmon

The Berriedale and Langwell Waters on the north-east coast of Scotland support small but high-quality population of Atlantic salmon. The rivers have two separate catchments, although they share a short length of river just before they meet the sea. Both rivers are oligotrophic and drain from the southern edge of the Caithness and Sutherland peatlands. Records indicate that the full range of Atlantic salmon life-cycle stages within the river (JNCC, 2023a).

The mouth of Berriedale and Langwell Waters is situated within Berriedale, approximately 75km (within the marine environment) from the proposed works area, where the watercourse flows into the North Sea. Salmon are habitual, returning to the same river each year (Mills, 1985). Thus, it is considered unlikely that Atlantic salmon from the Berriedale or Langwell Waters would bypass the mouth of the waters and travel a greater distance to enter the Cromarty Firth to spawn within one of the rivers which flow into the Cromarty Firth. Hence, there is considered to be **no ecological connectivity, and the qualifying interest 'Atlantic salmon associated with the Berriedale and Langwell Waters SAC', is excluded from further assessment.**

6.11 Firth of Tay and Eden Estuary SAC

6.11.1 Habitats

The Firth of Tay and Eden Estuary SAC supports three Annex I habitats. Including, estuaries, intertidal mudflats and sandflats and subtidal sandbanks (JNCC, 2023d).

The Firth of Tay and the Eden Estuary are two high-quality estuarine areas. The two estuaries are included within a single SAC because they are integral components of a large, geomorphologically complex area that incorporates a mosaic of estuarine and coastal habitats. The Firth of Tay is the least-modified of the large east coast estuaries in Scotland. The Eden Estuary represents a smaller 'pocket' estuary. The inner parts of the estuaries are sheltered from waves, while outer areas, particularly of the Firth of Tay, are exposed to strong tidal streams. This has resulted in a complex pattern of erosion and deposition of the sandbank feature at the firths' mouth. The sediments within the SAC support biotopes reflective of the gradients of exposure and salinity. The abundance, distribution and composition of the associated fauna and flora are ecologically representative of northern North Sea estuaries. In addition, the Firth of Tay and Eden Estuary SAC supports sandbanks which are 'slightly covered by sea water all the time' and 'mudflats and sandflats that are not covered by seawater at low tide' (JNCC, 2023d).

Each of the qualifying interests listed above are habitats and hence are immobile features. When considering the distance within the marine environment, there is approximately 153km

around the coastline between the Firth of Tay and Eden Estuary SAC and the proposed works area. Disturbance and sedimentation associated with dredging will be extremely localised. Therefore, it is considered unlikely that the proposed works would cause any disturbance or degradation of marine or intertidal habitats within the Firth of Tay or Eden Estuary. Therefore, there is considered to be **no ecological connectivity and the qualifying interests 'estuaries, intertidal mudflats and sandflats and subtidal sandbanks associated with the Firth of Tay and Eden Estuary SAC', are excluded from further assessment.**

6.11.2 Common Seal

The Firth of Tay and Eden Estuary supports a nationally important breeding colony of common seal (*Phoca vitulina*) (an Annex II species). Around 600 adults haul-out at the site to rest, pup, and moult, representing around 2% of the UK population of the species (JNCC, 2023d).

Common seal are a mobile feature, with foraging distances of typically 50km (Lyons, 2004). However, in order to reach the proposed works area from the Firth of Tay or Eden Estuary, common seal would need to travel approximately ≥ 286 km within the marine environment. Therefore, it is considered unlikely that common seal would range between the SAC and the proposed works area. Hence, there is considered **no ecological connectivity, and the qualifying interest 'common seal associated with the Firth of Tay and Eden Estuary SAC', is excluded from further assessment.**

6.12 Faray and Holm of Faray SAC

6.12.1 Grey Seal

Faray and Holm of Faray are two uninhabited islands in the northern part of Orkney, which support a well-established grey seal breeding colony. The seals tend to be found in areas where there is easy access from the shore. Freshwater pools on the islands appear to be particularly important. The islands support the second-largest breeding colony in the UK, contributing around 9% of annual UK pup production (JNCC, 2023c).

In the marine environment, grey seal would need to travel approximately ≥ 205 km from the Faray and Holm of Faray SAC to reach the proposed works area. Grey seal are a highly mobile feature, which undertake both short-distance and long-distance travel. A study tracking grey seal identified that individuals return to the same haul-out site during 88% of trips. Travelling a mean return distance of 39.8km (McConnell, *et al.*, 2001). Long-distance travel by grey seal has been recorded up to 2,100km. However, long-distance trips are generally undertaken to known haul-out sites (McConnell, *et al.*, 2001). There is a designated haul-out site for common seals within the Cromarty Firth, approximately 8.5km from the proposed works area (Marine Scotland, 2023). However, there are no known records of grey seal at this haul-out site (NBN, 2023). Thus, it would be considered reasonable to assume that grey seal from the Faray and Holm of Faray SAC are not making long-distance trips to within close proximity to the proposed works area. Hence, there is considered **no ecological connectivity, and the qualifying interest 'grey seal associated with the Faray and Holm of Faray SAC', is excluded from further assessment.**

7 Screening for Likely Significant Effect(s)

Where the potential for ecological connectivity between a qualifying interest associated with a European Site and the proposed works area has been identified, the potential for LSE(s) has been assessed with consideration to the conservation objectives of the site.

The potential ecological connectivity for each qualifying interest is detailed within this section, alongside justification for the assessment for LSE.

As aforementioned, the data collected during winter and breeding bird surveys has been used to understand the potential for LSE to ornithological qualifying interests associated with European Sites with potential ecological connectivity to the proposed works area (see Table A1.1; Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos 2023).

7.1 Cromarty Firth SPA

The Cromarty Firth SPA is a large, narrow-mouthed estuary which supports the largest intertidal flats in the Moray Basin. The boundaries of the SPA mostly follow those of the Cromarty Firth SSSI and the estuarine section of Lower River Conon SSSI (SNH, 2018a).

The Cromarty Firth SPA qualifies under Article 4.1 by regularly supporting populations of European importance of the Annex 1 species. Including osprey, which forage throughout the SPA (2008 to 2012, five year mean of up to 25 territories within feeding range, 12.5% of the GB population, with 1 pair breeding within the site, 1% of the GB population), common tern (*Sterna hirundo*) (1989 to 1993 mean of 294 pairs; 2% of the GB population), whooper swan (1992/93 to 1996/97 winter peak mean of 64 individuals, 1% of the GB population) and bar-tailed godwit (*Limosa lapponica*) (1,355 wintering individuals, 3% of the GB population) (SNH, 2018a).

The Cromarty Firth SPA further qualifies under Article 4.2 by regularly supporting a population of European importance of the migratory species, greylag goose (*Anser anser*) (1992/93 to 1996/97 winter peak mean of 1,782 individuals; 2% of the Iceland/UK/Ireland biogeographic population) (SNH, 2018a).

The Cromarty Firth SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. In the five-year period 1992/93 to 1996/97, a winter peak mean of 30,200 individual waterfowl was recorded, comprising 14,800 wildfowl and 15,400 waders including nationally important populations of redshank (*Tringa tetanus*) (1,149 individuals, 1% of the GB population), curlew (*Numenius arquata*) (1,313 individuals, 1% of the GB population), knot (*Calidris canutus*) (4,312 individuals, 1% of the GB population), red-breasted merganser (*Mergus serrator*) (204 individuals, 2% of the GB population), scaup (295 individuals, 3% of the GB population), pintail (*Anas acuta*) (319 individuals, 1% of the GB population), wigeon (*Anas penelope*) (9,204 individuals, 3% of the GB population), greylag goose (1,782 individuals, 2% of the GB population), bar-tailed godwit (1,355 individuals) and whooper swan (64 individuals). In the five-year period 1991/92 to 1995/96, a winter peak mean of 34,847 individual waterfowl was recorded with the assemblage additionally including nationally important populations greater than 2,000 individuals of dunlin (*Calidris alpina alpina*) (3,384 individuals, 0.6% of the GB population) and oystercatcher (*Haematopus ostralegus*) (2004/5 to 2009/10, 2,702 individuals, 0.8% of the GB population) (SNH, 2018a).

The conservation objectives for the Cromarty Firth SPA are shown in Table 7.1.1.

Table 7.1.1: Conservation Objectives of the Cromarty Firth SPA

| Conservation Objectives of the European Site |
|---|
| <p>Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.</p> |
| <p>Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species. |

All fifteen of the qualifying interests of the Cromarty Firth SPA were identified to have potential ecological connectivity to the site due to the proximity of the proposed works area to the SPA (<100m) and the mobile nature of marine and intertidal bird species. Hence, all fifteen qualifying interests associated with the Cromarty Firth SPA have been taken forward to screening for LSE. The potential for ecological connectivity for each qualifying interest is detailed in Table 7.1.2, alongside an assessment for LSE, with consideration to the conservation objectives of the site, detailed in Table 7.1.1.

Table 7.1.2: Screening for LSE of the Qualifying Interests of the Cromarty Firth SPA

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Osprey | <p>Osprey generally forage up to 10km of the nest (Hardey, <i>et al.</i>, 2013). Hence, the proposed works area is situated within the potential foraging range of osprey associated with the Cromarty Firth SPA. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'osprey associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>Osprey are migratory, returning to the UK in late-March to early-April for breeding. As the works are expected to be completed prior to April 2024, it is likely that osprey will not yet be present within the SPA. However, should osprey return prior to the completion of works, it is noted that osprey are unlikely to utilise habitats within and around the proposed works area to forage. Foraging dependencies of coastal populations of osprey have been found to correlate with the sea surface temperature (SST), which is known to have an impact upon the availability of surface-dwelling fish (Crawshaw & O'Connor 1997). Marquiss <i>et al.</i>, 2007 identified that osprey were primarily freshwater foragers where the SST of the adjacent coastline was 11°C in June. As the average SST of the Cromarty Firth in June is 11.1°C (SeaTemperature, 2023), it would be considered justifiable to assume that local populations of osprey predominantly forage on freshwater fish in rivers and at estuaries. Furthermore, there are no known records of osprey within 10km of the proposed works area (NBN, 2023).</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by osprey or significant disturbance to osprey. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'osprey associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Common tern | <p data-bbox="831 282 963 315" style="text-align: center;">[Redacted]</p> <p data-bbox="395 607 1390 808">However, works are scheduled to be completed prior to April 2024. As common tern are not expected to return to the UK prior to April 2024, no significant disturbance to the species is expected. The use of the plough dredging technique in waters over 11m deep, will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p data-bbox="395 853 1390 1160">Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by common tern or significant disturbance to common tern. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'common tern associated with the Cromarty Firth SPA', is expected.</p> |
| Whooper swan | <p data-bbox="395 1173 1390 1413">Whooper swan have not been recorded during any of the winter bird surveys or breeding bird surveys (see Table A1.1; Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos, 2023). Nonetheless, due to the mobile nature of the species and the proximity of the SPA to the proposed works area (<100m), a precautionary approach has been taken. Hence, there is considered to be potential ecological connectivity between the qualifying interest 'whooper swan associated with the Cromarty Firth SPA', and the proposed works area.</p> <p data-bbox="395 1458 1390 1592">However, as whooper swan have never been identified during any of the bird surveys and there are no known records of the species within 2km of the proposed works area (NBN, 2023), it would be considered justifiable to assume that whooper swan do not utilise the area on a frequent basis.</p> <p data-bbox="395 1637 1390 1935">Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by whooper swan or significant disturbance to whooper swan. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'whooper swan associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Bar-tailed godwit | <p>Wintering bar-tailed godwit were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2016/17 winter bird surveys (see Table A1.1). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'bar-tailed godwit associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As bar-tailed godwit are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by bar-tailed godwit or significant disturbance to bar-tailed godwit. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'bar-tailed godwit associated with the Cromarty Firth SPA', is expected.</p> |
| Greylag goose | <p>An individual greylag goose was recorded on one occasion during the 2022/23 winter bird survey of the shoreline adjacent to the ISB (just outwith the SPA) (see Table A1.1). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'greylag goose associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>Nonetheless, the individual recording was the first time that the species has been recorded during the bird surveys undertaken over several years. The goose landed within the water close to shore during the survey and rested for two/three minutes before flying away. No behaviour was observed other than resting (Affric, 2023). Therefore, the observation is not considered to be confirmation that the species utilise the area on a frequent basis.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by greylag goose or significant disturbance to greylag goose. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'greylag goose associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Redshank | <p>Wintering redshank were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'redshank associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As redshank are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by redshank or significant disturbance to redshank. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'redshank associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Curlew | <p>Wintering curlew were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Furthermore, breeding curlew were recorded on the shoreline adjacent to the ISB during the 2022 and 2023 breeding bird surveys (Atmos, 2022; and Atmos, 2023). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'curlew associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>Works are scheduled to be completed prior to April 2024. Hence, no disturbance to breeding birds is expected, as the breeding season for the species is expected to commence in April (Bowgen, <i>et al.</i>, 2021). In addition, it should be noted that, should curlew begin to nest prior to April, the proposed works area is situated outwith the known maximum disturbance distance of the species during breeding season from viable breeding habitat (>300m, NatureScot, 2020).</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As curlew are wading birds, they are unlikely to be present within the proposed works area. The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<650m, NatureScot, 2020). However, only 0.03km² of the SPA falls within this maximum disturbance distance (0.1% of the area of the entire SPA, SNH 2018a), and the results on the winter bird surveys suggest that this area is not particularly favoured by the species (see Table A1.1). Furthermore, it is noted that the maximum number of individuals recorded during a winter bird survey within 650m of the proposed works area (i.e., the total of all individuals recorded in Sections A, B and C during an individual survey; see Drawing 71_DRG_9_1) was 11 (see Table A1.1). Thus, should the species make use of intertidal habitats within 650m of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 0.84% of the curlew population of the SPA (NatureScot, 2018). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by curlew or significant disturbance to curlew. Hence, the integrity of the SPA will be maintained no LSE to the qualifying interest 'curlew associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Knot | <p>Knot have not been recorded during any of the winter bird surveys or breeding bird surveys (see Table A1.1; Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos, 2023). Nonetheless, as due to the mobile nature of the species and the proximity of the SPA to the proposed works area (<100m), a precautionary approach has been taken. Hence, there is considered to be potential ecological connectivity between the qualifying interest 'knot associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>However, as knot have never been identified during any of the bird surveys, it would be considered justifiable to assume that knot do not utilise the area on a frequent basis.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by knot or significant disturbance to knot. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'knot associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|------------------------|---|
| Red-breasted merganser | <p>Wintering red-breasted merganser were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2015/16 and 2020/21 winter bird surveys (see Table A1.1). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'red-breasted merganser associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>The works will be undertaken in water depths of 11m. As red-breasted merganser generally forage at depths of 5m, the species is not expected to be present in the area of works.</p> <p>The typical disturbance distance of the species is currently unknown (NatureScot, 2020). There is evidence to suggest the species may be disturbed by vessels at a distance between 200m and 300m (SNH, 2019). Sightings of the species have occurred over 250m away from the base and it's noted that the proposed works do not vary from the existing levels of activity at the ISB and therefore are unlikely to cause disturbance. As such, it is considered unlikely that red-breasted merganser will be disturbed by the proposed works.</p> <p>Should the species make use of shoreline or marine habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 1.5% of the population of the SPA (SNH, 2018e). Therefore, localised temporary disturbance associated with the proposed dredging works is not expected to cause significant disturbance to the species as a feature of the Cromarty Firth SPA.</p> <p>The use of the plough dredging technique in waters over 11m deep will cause increased sediment loading at depth, and sedimentation effects will be extremely localised with sedimentation not occurring at the surface where the species may forage and feed, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by red-breasted merganser or significant disturbance to red-breasted merganser. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'red-breasted merganser associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Scaup | <p>Scaup have not been recorded during any of the winter bird surveys or breeding bird surveys (see Table A1.1; Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos, 2023). Nonetheless, due to the mobile nature of the species and the proximity of the SPA to the proposed works area (<100m), a precautionary approach has been taken. Hence, there is considered to be potential ecological connectivity between the qualifying interest 'scaup associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>However, as scaup have never been identified during any of the bird surveys, it would be considered justifiable to assume that scaup do not utilise the area on a frequent basis.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by scaup or significant disturbance to scaup. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'scaup associated with the Cromarty Firth SPA', is expected.</p> |
| Pintail | <p>Pintail have not been recorded during any of the winter bird surveys or breeding bird surveys (see Table A1.1; Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos, 2023). Nonetheless, as due to the mobile nature of the species and the proximity of the SPA to the proposed works area (<100m), a precautionary approach has been taken. Hence, there is considered to be potential ecological connectivity between the qualifying interest 'pintail associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>However, as pintail have never been identified during any of the bird surveys and there are no known records of the species within 2km of the proposed works area (NBN, 2023), it would be considered justifiable to assume that pintail do not utilise the area on a frequent basis.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by pintail or significant disturbance to pintail. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'pintail associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Wigeon | <p>Wintering wigeon were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'wigeon associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<500m, NatureScot, 2020). However, only 0.01km² of the adjacent shoreline falls within this maximum disturbance distance (0.04% of the area of the entire SPA, SNH, 2018a). Furthermore, it is noted that no individuals have ever been recorded during a winter bird survey within 500m of the proposed works area (i.e., within in Sections A, B and C; see Drawing 71_DRG_9_1; and Table A1.1). Hence, it is considered unlikely that any individuals will be present within possible disturbance distance of the works. Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by wigeon or significant disturbance to wigeon. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'wigeon associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Dunlin | <p>Wintering dunlin were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2017/18 and 2022/23 winter bird surveys (see Table A1.1). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'dunlin associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As dunlin are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by dunlin or significant disturbance to dunlin. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'dunlin associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Oystercatcher | <p>Wintering oystercatcher were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Furthermore, breeding oystercatcher were recording on the shoreline adjacent to the ISB during the breeding bird survey in 2022 and within the ISB and adjacent habitats during the breeding bird survey in 2023 (Atmos, 2022; and Atmos, 2023). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'oystercatcher associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>Works are scheduled to be completed prior to April 2024. The oystercatcher breeding season generally commences in late March. Therefore, it is possible that nesting oystercatcher may be present at the time of works. However, the proposed works area is situated outwith the known maximum disturbance distance of the species during breeding season from viable breeding habitat (>100m, NatureScot, 2020). Thus, no disturbance to breeding oystercatcher is expected.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As oystercatcher are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species during the non-breeding season.</p> <p>The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by oystercatcher or significant disturbance to oystercatcher. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'oystercatcher associated with the Cromarty Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|-----------------------------------|--|
| <p>In excess 20,000 waterfowl</p> | <p>Wintering and breeding waterfowl were identified at the ISB and the adjacent shoreline (within the SPA) during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1) and during the 2016, 2017, 2022 and 2023 breeding bird surveys (Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos 2023). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'in excess of 20,000 individual waterfowl associated with the Cromarty Firth SPA', and the proposed works area.</p> <p>The proposed dredging works are scheduled to be completed prior to April 2024. Hence, no disturbance to breeding birds is expected. Furthermore, disturbance associated with the proposed works is not expected to exceed that of existing ongoing activities at Berths 5 and 6. As no boats will be docking at the berths during the time of works, in-combination effects are not anticipated.</p> <p>The typical disturbance distance of each individual species within the population will vary (NatureScot, 2020). Therefore, it has been assumed that the proposed works area may lie within the disturbance distance of some waterfowl species from the adjacent shoreline. However, the results on the winter bird surveys suggest that the eastern edge of the shoreline (i.e., that closest to the proposed works area) is not particularly favoured by any species (see Table A1.1). It is noted that the total maximum number of individual waterfowl species recorded during a winter bird survey (along the entirety of the shoreline) was 330 (see Table A1.1). Thus, should the species make use of shoreline or marine habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 1.65% of the waterfowl population of the SPA (SNH, 2018a). Therefore, localised temporary disturbance associated with the proposed dredging works is not expected to cause significant disturbance to the waterfowl population or impact upon the integrity of the SPA.</p> <p>Furthermore, the proposed works area is not considered to be of optimal foraging suitability for waterfowl due to its existing nature as a vessel berth. Thus, the proposed dredging works are not expected to deteriorate any habitats utilised by the waterfowl species. Hence, no LSE to the qualifying interest 'in excess of 20,000 waterfowl associated with the Cromarty Firth SPA', is expected.</p> |

As identified within Table 7.1.2, potential ecological connectivity for all fifteen of the qualifying interests of the Cromarty Firth SPA, including osprey, common tern, whooper swan, bar-tailed godwit, greylag goose, redshank, curlew, knot, red-breasted merganser, scaup, pintail, wigeon, dunlin, oystercatcher and 'in excess of 20,000 individual waterfowl' has been identified. However, no LSE due to the proposed dredging works is anticipated for any of the fifteen qualifying interests. Therefore, **it is advised that the requirement for an AA is unlikely to be applicable to any of the qualifying interests associated with the Cromarty Firth SPA.**

7.2 Moray Firth SAC

The Moray Firth SAC in north-east Scotland supports the only known resident population of bottlenose dolphin (*Tursiops truncatus*) in the North Sea. The population is estimated to be around 130 individuals. Bottlenose dolphins are present all year round, and, while they range widely in the Moray Firth, they appear to favour particular areas (JNCC, 2023e).

The conservation objectives for the Moray Firth SAC are shown in Table 7.2.1.

Table 7.2.1: Conservation Objectives of the Moray Firth SAC

| Conservation Objectives of the European Site |
|--|
| <p>Overarching Conservation Objective: To ensure that the qualifying interests of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.</p> |
| <p>Further Conservation Objective (bottlenose dolphin only): To ensure that the integrity of Moray Firth SAC is maintained or restored in the context of environmental changes by ensuring that:</p> <ul style="list-style-type: none"> • The population of bottlenose dolphin is a viable component of the site; • The distribution of bottlenose dolphin throughout the site is maintained by avoiding significant disturbance; and • The supporting habitats and processes relevant to bottlenose dolphin and the availability of prey for bottlenose dolphin are maintained. |

One of the qualifying interests of the Moray Firth SAC was screened out from LSE assessment due to a lack of ecological connectivity between the feature and the proposed works area (see Section 6.1). However, one of the qualifying interests of the Moray Firth SAC was identified to have potential ecological connectivity to the site due the known presence of the species within the Cromarty Firth and the mobile nature of the species. The qualifying interest, bottlenose dolphin, associated with the Moray Firth SAC has therefore been taken forward to screening for LSE. The potential for ecological connectivity for the qualifying interest is detailed in Table 7.2.2, alongside an assessment for LSE, with consideration to the conservation objectives of the site, detailed in Table 7.2.1.

Table 7.2.2: Screening for LSE of the Qualifying Interests of the Moray Firth SAC

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Bottlenose dolphin | <p>Bottlenose dolphin have been recorded ranging between 12-105km in an estuarine environment (Balmer, <i>et al.</i>, 2014; and Nekolny, 2017). Within the marine environment, bottlenose dolphin would only need to travel approximately 5.6km to reach the proposed works area from the SAC. Furthermore, there are records of bottlenose dolphin within the Cromarty Firth (NBN, 2023). Therefore, there is considered to be potential ecological connectivity between the proposed works area and the qualifying interest 'bottlenose dolphin associated with the Moray Firth SAC'.</p> <p>Bottlenose dolphin have been recorded as far up the Cromarty Firth as the ISB on rare occasions. The plough dredge will be towed behind a vessel, which will be moving slowly across the area in a systematic fashion. The vessel will be moving and towing alongside the berth, in approximately 11m of depth and 100m out from the berth. It is not expected that bottlenose dolphins would be in the location of works as they do not tend to favour this area, with the majority of sightings located at the Sutors off Cromarty and Chanonry Point in Fortrose where there is optimal foraging and feeding habitat (Hastie et al, 2004).</p> <p>Sedimentation associated with the proposed dredging works is expected to be extremely localised, with sediment loading in the water column only increasing at depth. Moreover, should bottlenose dolphin be present within the locality of the works they are expected to use echolocation to find, track and intercept individual prey items (Nowacek, 2005; and Hastie <i>et al.</i>, 2006) and it is therefore unlikely that the small, localised, temporary increase in sedimentation would impair their foraging abilities.</p> <p>It is not expected that, if dolphins were in the area, they would interact with the vessel and tow and would be able to detect its presence underwater through their use of echolocation. It is therefore not anticipated that the vessel would cause disturbance or harm to bottlenose dolphin associated with the Moray Firth SAC and will not affect the population or distribution.</p> <p>Pollutants released into the water as a result of the release of hydraulic oils or fluids from the vessel or a break in machinery could have a negative effect, direct or indirect, on bottlenose dolphin. However, in the unlikely event of a pollution incident, the scale of the event is likely to be too small to affect the designated site and its qualifying features if they were to be present in the area of the works.</p> <p>Furthermore, the proposed works are not expected to generate excessive underwater noise. The main source of noise being the vessel itself, which is not unusual in this area.</p> <p>It is therefore anticipated that there will be no LSE to the qualifying interest 'bottlenose dolphin associated with the Moray Firth SAC.'</p> |

As identified within Table 7.2.2, potential ecological connectivity for one of the qualifying interests of the Moray Firth SAC, bottlenose dolphin, has been identified. However, no LSE due to the proposed dredging works is anticipated for the qualifying interest. Therefore, **it is advised that the requirement for an AA is unlikely to be applicable to any of the qualifying interests associated with the Moray Firth SAC.**

7.3 Moray Firth SPA

The Moray Firth SPA is a funnel-shaped body of sea situated on the north-east mainland coast of Scotland. Much of the Moray Firth is comprised of shallow water (<20m) over a sandy substrate, with the exception of a 50m deep channel running east-west through muddy substrate. Tidal flows are relatively weak, with a maximum tidal range of 3m. The Moray Firth is an important spawning ground and nursery area for a number of fish species, which together with abundant bivalve molluscs, are important prey species for seabirds (SNH, 2018e).

The Moray Firth SPA qualifies under Article 4.2 by regularly supporting populations of European importance of migratory species. Including common eider (*Somateria mollissima*) (a mean peak annual non-breeding population of 1,733 individuals (2.9% of the GB population) for the years of 2001/02 to 2006/07), common goldeneye (*Bucephala clangula*) (a mean peak annual non-breeding population of 907 individuals (4.5% of the GB population) for the years 2001/02 to 2005/06), red-breasted merganser (a mean peak annual non-breeding population of 151 individuals (1.8% of the GB population) for the years of 2001/02 to 2005/06) and European shag (*Phalacrocorax aristotelis*) (at least 6,462 individuals during the non-breeding season (3.2% of the biogeographic population and 5.9% of the GB population) and 5,494 individuals during the breeding season ((2.7% of the biogeographic population & 10.2% of the GB population) for the years 1980-2006) (SNH, 2018e).

The conservation objectives for the Moray Firth SPA are shown in Table 7.3.1.

Table 7.3.1: Conservation Objectives of the Moray Firth SPA

| Conservation Objectives of the European Site |
|---|
| <p>Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species.</p> |
| <p>Further Conservation Objectives: Avoid significant mortality, injury, and disturbance of the qualifying interests, so that the distribution of the species and ability to use the site are maintained in the long-term and maintain the habitats and food resources of the qualifying interests in favourable condition.</p> |

Seven of the qualifying interests of the Moray Firth SPA were screened out from LSE assessment due to a lack of ecological connectivity between the features and the proposed works area (see Section 6.2). However, four of the qualifying interests of the Moray Firth SPA were identified to have potential ecological connectivity to the site due the known presence of the species within habitats adjacent to the proposed works and the mobile nature of marine and intertidal bird species. These four species, including common eider, common goldeneye, red-breasted merganser and European shag associated with the Moray Firth SPA have therefore been taken forward to screening for LSE. The potential for ecological connectivity for each qualifying interest is detailed in Table 7.3.2, alongside an assessment for LSE, with consideration to the conservation objectives of the site, detailed in Table 7.3.1.

Table 7.3.2: Screening for LSE of the Qualifying Interests of the Moray Firth SPA

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Common eider | <p>Wintering common eider were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Furthermore, breeding common eider were recorded on the rock armour of the ISB in 2016, 2017, 2022 and 2023 (Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos 2023) and on the shoreline adjacent to the ISB in 2022 and 2023 (Atmos, 2022; and Atmos, 2023). Thus, there is considered to be potential for common eider from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'common eider associated with the Moray Firth SPA', and the proposed works area.</p> <p>Works are scheduled to be completed prior to April 2024. Hence, no disturbance to breeding birds is expected, as the breeding season for the species is expected to commence mid-April (Christensen, 2000).</p> <p>The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<500m, NatureScot, 2020). However, it is noted that the maximum number of individuals recorded during a winter bird survey within 500m of the proposed works area (i.e., the total of all individuals recorded in Sections A, B and C during an individual survey; see Drawing 71_DRG_9_1) was 2 (see Table A1.1). Thus, should the species make use of habitats within 500m of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 0.17% of the common eider population of the SPA (SNH, 2018e). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by common eider or significant disturbance to common eider. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'common eider associated with the Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Common goldeneye | <p>Wintering common goldeneye were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for common goldeneye from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'common goldeneye associated with the Moray Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<800m, NatureScot, 2020). However, it is noted that the maximum number of individuals recorded during a winter bird survey within 800m of the proposed works area (i.e., the total of all individuals recorded in Sections A, B, C and D during an individual survey; see Drawing 71_DRG_9_1) was 3 (see Table A1.1). Thus, should the species make use of habitats within 800m of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 0.33% of the common goldeneye population of the SPA (SNH, 2018e). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by common goldeneye or significant disturbance to common goldeneye. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'common goldeneye associated with the Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|------------------------|--|
| Red-breasted merganser | <p>Wintering red-breasted merganser were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2015/16 and 2020/21 winter bird surveys (see Table A1.1). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'red-breasted merganser associated with the Moray Firth SPA', and the proposed works area.</p> <p>The works will be undertaken in water depths of 11m. As red-breasted merganser generally forage at depths of 5m, the species is not expected to be present in the area of works.</p> <p>The typical disturbance distance of the species is currently unknown (NatureScot, 2020). There is evidence to suggest the species may be disturbed by vessels at a distance between 200m and 300m (SNH, 2019). Sightings of the species have occurred over 250m away from the base and it's noted that the proposed works do not vary from the existing levels of activity at the ISB and therefore are unlikely to cause disturbance. As such, it is considered unlikely that red-breasted merganser will be disturbed by the proposed works.</p> <p>Should the species make use of shoreline or marine habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 1.5% of the population of the SPA (SNH, 2018e). Therefore, localised temporary disturbance associated with the proposed dredging works is not expected to cause significant disturbance to the species as a feature of the Moray Firth SPA.</p> <p>The use of the plough dredging technique in waters over 11m deep will cause increased sediment loading at depth, and sedimentation effects will be extremely localised with sedimentation not occurring at the surface where the species may forage and feed. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by red-breasted merganser or significant disturbance to red-breasted merganser. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'red-breasted merganser associated with the Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| European shag | <p>Wintering European shag were recorded on the shoreline adjacent to the ISB during the 2015/16 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for European shag from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'European shag associated with the Moray Firth SPA', and the proposed works area.</p> <p>The typical disturbance distance of the species is currently unknown (NatureScot, 2020). Therefore, it has been assumed that the proposed works area may lie within the disturbance distance of the species from the adjacent shoreline. However, the results of the winter bird surveys suggest that the eastern edge of the shoreline (i.e., that closest to the proposed works area) is not particularly favoured by the species (see Table A1.1). Furthermore, it is noted that the maximum number of individuals recorded during a winter bird survey (along the entirety of the shoreline) was 3 (see Table A1.1). Thus, should the species make use of shoreline or marine habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 0.05% of the European shag population of the SPA (SNH, 2018e). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by common goldeneye or significant disturbance to European shag. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'European shag associated with the Moray Firth SPA', is expected.</p> |

As identified within Table 7.3.2, potential ecological connectivity for four of the qualifying interests of the Moray Firth SPA, including common eider, common goldeneye, red-breasted merganser, and European shag has been identified. However, no LSE due to the proposed dredging works is anticipated for any of the four qualifying interests. Therefore, **it is advised that the requirement for an AA is unlikely to be applicable to any of the qualifying interests associated with the Moray Firth SPA.**

7.4 Inner Moray Firth SPA

The Inner Moray Firth SPA comprises of the Beaully Firth and Inverness Firth, which together form the eastern-most estuarine component of the Moray Basin ecosystem. The SPA contains extensive intertidal flats, saltmarsh, and sand dunes. The boundary of the SPA follows those of the Beaully Firth SSSI, Longman and Castle Stuart Bays SSSI, Whiteness Head SSSI and most of Munloch Bay SSSI (SNH, 2018c).

Inner Moray Firth SPA qualifies under Article 4.1 by regularly supporting populations of European importance of Annex 1 species. Including common tern (310 pairs, 2% of the GB population) and bar-tailed godwit (1992/93 to 1996/97 a winter peak mean of 1,090 individuals, 2% of the GB population) (SNH, 2018c).

The Inner Moray Firth SPA further qualifies under Article 4.2 by regularly supporting populations of European importance of migratory species (1992/93 to 1996/97 winter peak means). Including greylag goose (2,651 individuals, 3% of the Iceland/UK/Ireland biogeographic population), red-breasted merganser (1,184 individuals, 1% of the northwest (NW) and Central Europe biogeographic population), and redshank (1,621 individuals, 1% of the Eastern Atlantic biogeographic population) (SNH, 2018c).

The Inner Moray Firth SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. Between 1992/93 to 1996/97 a winter peak mean of 26,800 individual waterfowl comprising 16,800 wildfowl and 10,000 waders including nationally important populations of curlew (1,262 individuals, 1% of the GB population), goosander (*Mergus merganser*) (325 individuals, 4% of the GB population), common goldeneye (218 individuals, 1% of the GB population), cormorant (*Phalacrocorax carbo*) (409 individuals, 3% of the GB population), redshank (1,621 individuals, 1% of the GB population), red-breasted merganser (1,184 individuals, 12% of the GB population), greylag goose (2,651 individuals, 3% of the GB population) and bar-tailed godwit (1,090 individuals). In the five-year period 1991/92 to 1995/96, a winter peak mean of 33,148 individual waterfowl was recorded with the assemblage additionally including a nationally important population, greater than 2,000 individuals, of oystercatcher (3,063 individuals, 0.9% of the GB population) (SNH, 2018c).

The conservation objectives for the Inner Moray Firth SPA are shown in Table 7.4.1.

Table 7.4.1: Conservation Objectives of the Inner Moray Firth SPA

| Conservation Objectives of the European Site |
|---|
| <p>Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.</p> |
| <p>Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species. |

Three of the qualifying interests of the Inner Moray Firth SPA were screened out from LSE assessment due to a lack of ecological connectivity between the features and the proposed works area (see Section 6.3). However, twelve of the qualifying interests of the Inner Moray Firth SPA were identified to have potential ecological connectivity to the site due the known presence of the species within habitats adjacent to the proposed works and the mobile nature of marine and intertidal bird species. These twelve qualifying interests, including common tern, bar-tailed godwit, greylag goose, red-breasted merganser, redshank, curlew, goosander, common goldeneye, wigeon, cormorant, oystercatcher and 'in excess of 20,000 waterfowl' associated with the Inner Moray Firth SPA have been taken forward to screening for LSE. The potential for ecological connectivity for each qualifying interest is detailed in Table 7.4.2,

alongside an assessment for LSE, with consideration to the conservation objectives of the site, detailed in Table 7.4.1.

Table 7.4.2: Screening for LSE of the Qualifying interests of the Inner Moray Firth SPA

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Common tern | <p>Breeding common tern were recorded on the rock armour of Berth 4 within the ISB in 2016, 2017 and 2023 (Swann & Brockway, 2016; Swann & Brockway, 2017; and Atmos, 2023). In addition, breeding common tern were recorded on a purpose-built tern nesting raft, situated approximately 1500m east-northeast of the ISB in 2022 and 2023 (Atmos, 2022; and Atmos, 2023). Thus, there is considered to be potential for common tern from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'common tern associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>However, works are scheduled to be completed prior to April 2024. As common tern are not expected to return to the UK prior to April 2024, no significant disturbance to the species is expected. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by common tern or significant disturbance to common tern. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'common tern associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Bar-tailed godwit | <p>Wintering bar-tailed godwit were recorded on the shoreline adjacent to the ISB during the 2016/17 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for bar-tailed godwit from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'bar-tailed godwit associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As bar-tailed godwit are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by bar-tailed godwit or significant disturbance to bar-tailed godwit. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'bar-tailed godwit associated with the Inner Moray Firth SPA', is expected.</p> |
| Greylag goose | <p>An individual greylag goose was recorded on one occasion during the 2022/23 winter bird survey (see Table A1.1). Thus, there is considered to be potential for greylag goose from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'greylag goose associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>Nonetheless, the individual recording was the first time that the species has been recorded during the bird surveys undertaken over several years. The goose landed within the water close to shore and rested for two/three minutes before flying away. No behaviour was observed other than resting (Affric, 2023). Therefore, the observation is not considered to be confirmation that the species utilise the area on a frequent basis.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by greylag goose or significant disturbance to greylag goose. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'greylag goose associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|------------------------|---|
| Red-breasted merganser | <p>Wintering red-breasted merganser were recorded on the shoreline adjacent to the ISB (within the SPA) during the 2015/16 and 2020/21 winter bird surveys (see Table A1.1). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'red-breasted merganser associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>The works will be undertaken in water depths of 11m. As red-breasted merganser generally forage at depths of 5m, the species is not expected to be present in the area of works.</p> <p>The typical disturbance distance of the species is currently unknown (NatureScot, 2020). There is evidence to suggest the species may be disturbed by vessels at a distance between 200 and 300m (SNH, 2019). Sightings of the species have occurred over 250m away from the base and it's noted that the proposed works do not vary from the existing levels of activity at the ISB and therefore are unlikely to cause disturbance. As such, it is considered unlikely that red-breasted merganser will be disturbed by the proposed works.</p> <p>Should the species make use of shoreline or marine habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 1.5% of the population of the SPA (SNH, 2018e). Therefore, localised temporary disturbance associated with the proposed dredging works is not expected to cause significant disturbance to the species as a feature of the Inner Moray Firth SPA.</p> <p>The use of the plough dredging technique in waters over 11m deep will cause increased sediment loading at depth, and sedimentation effects will be extremely localised with sedimentation not occurring at the surface where the species may forage and feed. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by red-breasted merganser or significant disturbance to red-breasted merganser. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'red-breasted merganser associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Redshank | <p>Wintering redshank were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for redshank from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'redshank associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As redshank are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by redshank or significant disturbance to redshank. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'redshank associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Curlew | <p>Wintering curlew were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Furthermore, breeding curlew were recording on the shoreline adjacent to the ISB during the 2022 and 2023 breeding bird surveys (Atmos, 2022; and Atmos, 2023). Thus, there is considered to be potential for curlew from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'curlew associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>Works are scheduled to be completed prior to April 2024. Hence, no disturbance to breeding birds is expected, as the breeding season for the species is expected to commence in April (Bowgen, <i>et al.</i>, 2021). In addition, it should be noted that, should curlew begin to nest prior to April, the proposed works area is situated outwith the known maximum disturbance distance of the species during breeding season from viable breeding habitat (>300m, NatureScot, 2020).</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As curlew are wading birds, they are unlikely to be present within the proposed works area.</p> <p>The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<650m, NatureScot, 2020). However, only 0.03km² of the adjacent shoreline falls within this maximum disturbance distance, and the results of the winter bird surveys suggest that this area is not particularly favoured by the species (see Table A1.1). Furthermore, it is noted that the maximum number of individuals recorded during a winter bird survey within 650m of the proposed works area (i.e., the total of all individuals recorded in Sections A, B and C during an individual survey; see Drawing 71_DRG_9_1) was 11 (see Table A1.1). Thus, should the species make use of intertidal habitats within 650m of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 0.87% of the curlew population of the SPA (NatureScot, 2018). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by curlew or significant disturbance to curlew. Hence, the integrity of the SPA will be maintained no LSE to the qualifying interest 'curlew associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Goosander | <p>Wintering goosander were recorded on the shoreline adjacent to the ISB during the 2020/21 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for goosander from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'goosander associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>The typical disturbance distance of the species is currently unknown (NatureScot, 2020). Therefore, it has been assumed that the proposed works area may lie within the disturbance distance of the species from the adjacent shoreline. However, the results on the winter bird surveys suggest that the eastern edge of the shoreline (i.e., that closest to the proposed works area) is not particularly favoured by the species (see Table A1.1). Furthermore, it is noted that the maximum number of individuals recorded during a winter bird survey (along the entirety of the shoreline) was 1 (see Table A1.1). Thus, should the species make use of shoreline or marine habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 0.31% of the goosander population of the SPA (SNH, 2018c). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by goosander or significant disturbance to goosander. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'goosander associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Common goldeneye | <p>Wintering common goldeneye were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for common goldeneye from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'common goldeneye associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<800m) (NatureScot, 2020). However, it is noted that the maximum number of individuals recorded during a winter bird survey within 800m of the proposed works area (i.e., the total of all individuals recorded in Sections A, B, C and D during an individual survey; see Drawing 71_DRG_9_1) was 3 (see Table A1.1). Thus, should the species make use of habitats within 800m of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 1.38% of the common goldeneye population of the SPA (SNH, 2018c). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by common goldeneye or significant disturbance to common goldeneye. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'common goldeneye associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Wigeon | <p>Wintering wigeon were recorded on the shoreline adjacent to the ISB during the 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for wigeon from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'wigeon associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<500m, NatureScot, 2020). However, only 0.01km² of the adjacent shoreline falls within this maximum disturbance distance, and it is noted that no individuals have ever been recorded during a winter bird survey within 500m of the proposed works area (i.e., within in Sections A, B and C; see Drawing 71_DRG_9_1; and Table A1.1). Hence, it is considered unlikely that any individuals will be present within possible disturbance distance of the works. Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by wigeon or significant disturbance to wigeon. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'wigeon associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Cormorant | <p>Wintering cormorant were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for cormorant from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'cormorant associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>The typical disturbance distance of the species is currently unknown (NatureScot, 2020). Therefore, it has been assumed that the proposed works area may lie within the disturbance distance of the species from the adjacent shoreline. However, the results of the winter bird surveys suggest that the eastern edge of the shoreline (i.e., that closest to the proposed works area) is not particularly favoured by the species (see Table A1.1). Furthermore, it is noted that the maximum number of individuals recorded during a winter bird survey (along the entirety of the shoreline) was 2 (see Table A1.1). Thus, should the species make use of habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 0.49% of the cormorant population of the SPA (SNH, 2018c). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by cormorant or significant disturbance to cormorant. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'cormorant associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Oystercatcher | <p>Wintering oystercatcher were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Furthermore, breeding oystercatcher were recording on the shoreline adjacent to the ISB during the breeding bird survey in 2022 and within the ISB and adjacent habitats during the breeding bird survey in 2023 (Atmos, 2022; and Atmos, 2023). Thus, there is considered to be potential for oystercatcher from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'oystercatcher associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>Works are scheduled to be completed prior to April 2024. The oystercatcher breeding season generally commences in late March. Therefore, it is possible that nesting oystercatcher may be present at the time of works. However, the proposed works area is situated outwith the known maximum disturbance distance of the species during breeding season from viable breeding habitat (>100m, NatureScot, 2020). Thus, no disturbance to breeding oystercatcher is expected.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As oystercatcher are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species during the non-breeding season.</p> <p>The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by oystercatcher or significant disturbance to oystercatcher. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'oystercatcher associated with the Inner Moray Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|--------------------------------------|--|
| <p>In excess of 20,000 waterfowl</p> | <p>Wintering and breeding waterfowl were identified at the ISB and the adjacent shoreline (within the SPA) during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1) and during the 2016, 2017, 2022 and 2023 breeding bird surveys (Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos 2023). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'in excess of 20,000 individual waterfowl associated with the Inner Moray Firth SPA', and the proposed works area.</p> <p>The proposed dredging works are scheduled to be completed prior to April 2024. Hence, no disturbance to breeding waterfowl is expected. Furthermore, disturbance associated with the proposed works is not expected to exceed that of existing ongoing activities at Berths 5 and 6. As no boats will be docking at the berths during the time of works, in-combination effects are not anticipated.</p> <p>The typical disturbance distance of each individual species within the population will vary (NatureScot, 2020). Therefore, it has been assumed that the proposed works area may lie within the disturbance distance of some waterfowl species from the adjacent shoreline. However, the results on the winter bird surveys suggest that the eastern edge of the shoreline (i.e., that closest to the proposed works area) is not particularly favoured by any species (see Table A1.1). It is noted that the total maximum number of individual waterfowl species recorded during a winter bird survey (along the entirety of the shoreline) was 330 (see Table A1.1). Thus, should the species make use of shoreline or marine habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 1.65% of the waterfowl population of the SPA (SNH, 2018a). Therefore, localised temporary disturbance associated with the proposed dredging works is not expected to cause significant disturbance to the waterfowl population or impact upon the integrity of the SPA.</p> <p>Furthermore, the proposed works area is not considered to be of optimal foraging suitability for waterfowl due to its existing nature as a vessel berth. Thus, the proposed dredging works are not expected to deteriorate any habitats utilised by the waterfowl species. Hence, no LSE to the qualifying interest 'in excess of 20,000 waterfowl associated with the Inner Moray Firth SPA', is expected.</p> |

As identified within Table 7.4.2, potential ecological connectivity for twelve of the qualifying interests of the Inner Moray Firth SPA, including common tern, bar-tailed godwit, greylag goose, red-breasted merganser, redshank, curlew, goosander, common goldeneye, wigeon, cormorant, oystercatcher and 'in excess of 20,000 waterfowl' has been identified. However, no LSE due to the proposed dredging works is anticipated for any of the twelve qualifying interests. Therefore, **it is advised that the requirement for an AA is unlikely to be applicable to any of the qualifying interests associated with the Inner Moray Firth SPA.**

7.5 Loch Eye SPA

Loch Eye SPA is a shallow, eutrophic loch situated between the Cromarty and Dornoch Firths, around 4km east of Tain. Only a small number of eutrophic lochs are located within the Scottish Highlands. The loch supports an abundance of hydrophytes (which cover >90% of the submerged sediments). The boundaries of the Loch Eye SPA are the same as the Loch Eye SSSI (SNH, 2018d).

The Loch Eye SPA qualifies under Article 4.2 by regularly supporting populations of European importance of migratory species. Including greylag goose (11,200 individuals, over 11% of the Iceland/UK/Ireland biogeographic population) (SNH, 2018d).

The conservation objectives for the Loch Eye SPA are shown in Table 7.6.1.

Table 7.5.1: Conservation Objectives of the Loch Eye SPA

| Conservation Objectives of the European Site |
|---|
| <p>Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.</p> |
| <p>Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species. |

One of the qualifying interests of the Loch Eye SPA was screen out from LSE assessment due to a lack of ecological connectivity between the feature and the proposed works area (see Section 6.4). However, one of the qualifying interests of the Loch Eye SPA was identified to have potential ecological connectivity to the site due the known presence of the species within habitats adjacent to the proposed works and the mobile nature of marine and intertidal bird species. The qualifying interest, greylag goose associated with the Loch Eye SPA, has therefore been taken forward to screening for LSE. The potential for ecological connectivity for the qualifying interest is detailed in Table 7.5.2, alongside an assessment for LSE, with consideration to the conservation objectives of the site, detailed in Table 7.5.1.

Table 7.5.2: Screening for LSE of the Qualifying Interests of the Loch Eye SPA

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Greylag goose | <p>An individual greylag goose was recorded on one occasion during the 2022/23 winter bird survey (see Table A1.1). Thus, there is considered to be potential for greylag goose from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'greylag goose associated with the Loch Eye SPA', and the proposed works area.</p> <p>Nonetheless, the individual recording was the first time that the species has been recorded during the bird surveys undertaken over several years. The goose landed within the water close to shore and rested for two/three minutes before flying away. No behaviour was observed other than resting (Affric, 2023). Therefore, the observation is not considered to be confirmation that the species utilise the area on a frequent basis.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by greylag goose or significant disturbance to greylag goose. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'greylag goose associated with the Loch Eye SPA', is expected.</p> |

As identified within Table 7.5.2, potential ecological connectivity for one of the qualifying interests of the Loch Eye SPA, greylag goose, has been identified. However, no LSE due to the proposed dredging works is anticipated for the qualifying interests. Therefore, **it is advised that the requirement for an AA is unlikely to be applicable to any of the qualifying interests associated with the Loch Eye SPA.**

7.6 Dornoch Firth and Loch Fleet SPA

Dornoch Firth and Loch Fleet SPA is a large area covering the two northernmost estuaries in the Moray Basin ecosystem. The Dornoch Firth is relatively unaffected by industrial development and supports large areas of intertidal flats, heath and sand dunes, saltmarsh, and a stretch of rocky shore. Loch Fleet is a narrow-mouthed estuary containing extensive sandflats which are bordered by dunes, pinewood and alderwood. The dune systems are of international importance for their flora and geomorphology. The boundaries of the SPA follow those of Dornoch Firth SSSI, Morrish More SSSI, Tarbat Ness SSSI, Loch Fleet SSSI and Mound Alderwoods SSSI except for the exclusion of a thin corridor of land on Morrish More SSSI (SNH, 2018b).

The Dornoch Firth and Loch Fleet SPA qualifies under Article 4.1 by regularly supporting populations of European importance of Annex 1 species. Including bar-tailed godwit (1989/90 to 1993/94 winter peak mean of 1,184 individuals, 2% of the GB population) (SNH, 2018b).

Dornoch Firth and Loch Fleet SPA further qualifies under Article 4.2 by regularly supporting populations of European importance of migratory species. Including greylag goose (1989/90

to 1993/94 winter peak mean of 1,146 individuals, 1% of the Icelandic/UK/Ireland biogeographic population) and wigeon (1989/90 to 1993/94 winter peak mean of 15,304 individuals, 2% of the west (W) Siberia/NW and northeast (NE) Europe biogeographic population) (SNH, 2018b).

Dornoch Firth and Loch Fleet SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. In the five-year period 1989/90 to 1993/94, a winter peak mean of approximately 34,500 individual waterfowl was recorded, comprising 22,000 wildfowl and 12,500 waders, including nationally important populations of curlew (1,397 individuals, 1.0% of the GB population), redshank (1,272 individuals, 1% of the GB population), wigeon (15,304 individuals, 5% of the GB population), greylag goose (1,146 individuals, 1% of the GB population) and bar-tailed godwit (1,184 individuals). The assemblage additionally now includes nationally important populations greater than 2,000 individuals of dunlin (2005/06 to 2009/10, winter peak mean of 4,088 individuals, 1% of the GB population) and oystercatcher (2004/05 to 2009/10, winter peak mean of a minimum of 2,459 individuals, 0.8% of the GB population) (SNH, 2018b).

The conservation objectives for the Dornoch Firth and Loch Fleet SPA are shown in Table 7.6.1.

Table 7.6.1: Conservation Objectives of the Dornoch Firth and Loch Fleet SPA

| Conservation Objectives of the European Site |
|---|
| <p>Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained</p> |
| <p>Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species. |

Three of the qualifying interests of the Dornoch Firth and Loch Fleet SPA were screened out from LSE assessment due to a lack of ecological connectivity between the features and the proposed works area (see Section 6.5). However, eight of the qualifying interests of the Dornoch Firth and Loch Fleet SPA were identified to have potential ecological connectivity to the site due the known presence of the species within habitats adjacent to the proposed works and the mobile nature of marine and intertidal bird species. These eight qualifying interests, including bar-tailed godwit, greylag goose, wigeon, curlew, redshank, dunlin, oystercatcher and 'in excess of 20,000 waterfowl' associated with the Dornoch Firth and Loch Fleet SPA have therefore been taken forward to screening for LSE. The potential for ecological connectivity for each qualifying interest is detailed in Table 7.6.2, alongside an assessment for LSE, with consideration to the conservation objectives of the site, detailed in Table 7.6.1.

Table 7.6.2: Screening for LSE of the Qualifying Interests of the Dornoch Firth and Loch Fleet SPA

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Bar-tailed godwit | <p>Wintering bar-tailed godwit were recorded on the shoreline adjacent to the ISB during the 2016/17 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for bar-tailed godwit from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'bar-tailed godwit associated with the Dornoch Firth and Loch Fleet SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As bar-tailed godwit are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by bar-tailed godwit or significant disturbance to bar-tailed godwit. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'bar-tailed godwit associated with the Inner Dornoch Firth and Loch Fleet SPA', is expected.</p> |
| Greylag goose | <p>An individual greylag goose was recorded on one occasion during the 2022/23 winter bird survey (see Table A1.1). Thus, there is considered to be potential for greylag goose from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'greylag goose associated with the Dornoch Firth and Loch Fleet SPA', and the proposed works area.</p> <p>Nonetheless, the individual recording was the first time that the species has been recorded during the bird surveys undertaken over several years. The goose landed within the water close to shore and rested for two/three minutes before flying away. No behaviour was observed other than resting (Affric, 2023). Therefore, the observation is not considered to be confirmation that the species utilise the area on a frequent basis.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by greylag goose or significant disturbance to greylag goose. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'greylag goose associated with the Dornoch Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Wigeon | <p>Wintering wigeon were recorded on the shoreline adjacent to the ISB during the 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for wigeon from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'wigeon associated with the Dornoch Firth and Loch Fleet SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<500m, NatureScot, 2020). However, only 0.01km² of the adjacent shoreline falls within this maximum disturbance distance, and it is noted that no individuals have ever been recorded during a winter bird survey within 500m of the proposed works area (i.e., within in Sections A, B and C; see Drawing 71_DRG_9_1; and Table A1.1). Hence, it is considered unlikely that any individuals will be present within possible disturbance distance of the works. Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by wigeon or significant disturbance to wigeon. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'wigeon associated with the Dornoch Firth and Loch Fleet SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Curlew | <p>Wintering curlew were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Furthermore, breeding curlew were recording on the shoreline adjacent to the ISB during the 2022 and 2023 breeding bird surveys (Atmos, 2022; and Atmos, 2023). Thus, there is considered to be potential for curlew from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'curlew associated with the Dornoch Firth and Loch Fleet SPA', and the proposed works area.</p> <p>Works are scheduled to be completed prior to April 2024. Hence, no disturbance to breeding birds is expected, as the breeding season for the species is expected to commence in April (Bowgen, <i>et al.</i>, 2021). In addition, it should be noted that, should curlew begin to nest prior to April, the proposed works area is situated outwith the known maximum disturbance distance of the species during breeding season from viable breeding habitat (>300m, NatureScot, 2020).</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As curlew are wading birds, they are unlikely to be present within the proposed works area. The proposed dredging works will be undertaken within the maximum known disturbance distance of the species from the shoreline during the non-breeding season (<650m, NatureScot, 2020). However, only 0.03km² of the adjacent shoreline falls within this maximum disturbance distance, and the results of the winter bird surveys suggest that this area is not particularly favoured by the species (see Table A1.1). Furthermore, it is noted that the maximum number of individuals recorded during a winter bird survey within 650m of the proposed works area (i.e., the total of all individuals recorded in Sections A, B and C during an individual survey; see Drawing 71_DRG_9_1) was 11 (see Table A1.1). Thus, should the species make use of intertidal habitats within 650m of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 0.79% of the curlew population of the SPA (NatureScot, 2018). Furthermore, the use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by curlew or significant disturbance to curlew. Hence, the integrity of the SPA will be maintained no LSE to the qualifying interest 'curlew associated with the Dornoch Firth SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|--|
| Redshank | <p>Wintering redshank were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for redshank from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'redshank associated with the Dornoch Firth and Loch Fleet SPA' and the proposed works area.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As redshank are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised, hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by redshank or significant disturbance to redshank. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'redshank associated with the Dornoch Firth and Loch Fleet SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Dunlin | <p>Wintering dunlin were recorded on the shoreline adjacent to the ISB during the 2017/18 and 2022/23 winter bird surveys (see Table A1.1). Thus, there is considered to be potential for dunlin from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'dunlin associated with the Dornoch Firth and Loch Fleet SPA', and the proposed works area.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As dunlin are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species. The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure, function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by dunlin or significant disturbance to dunlin. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'dunlin associated with the Dornoch Firth and Loch Fleet SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Oystercatcher | <p>Wintering oystercatcher were recorded on the shoreline adjacent to the ISB during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1). Furthermore, breeding oystercatcher were recording on the shoreline adjacent to the ISB during the breeding bird survey in 2022 and within the ISB and adjacent habitats during the breeding bird survey in 2023 (Atmos, 2022; and Atmos, 2023). Thus, there is considered to be potential for wigeon from the SPA to range within the area of the proposed works. Therefore, there is considered to be potential ecological connectivity between the qualifying interest 'oystercatcher associated with the Dornoch Firth and Loch Fleet SPA', and the proposed works area.</p> <p>Works are scheduled to be completed prior to April 2024. The oystercatcher breeding season generally commences in late March. Therefore, it is possible that nesting oystercatcher may be present at the time of works. However, the proposed works area is situated outwith the known maximum disturbance distance of the species during breeding season from viable breeding habitat (>100m, NatureScot, 2020). Thus, no disturbance to breeding oystercatcher is expected.</p> <p>The proposed dredging works will be undertaken in waters over 11m deep. As oystercatcher are wading birds, they are unlikely to be present within the proposed works area. Furthermore, as the adjacent shoreline lies outwith the maximum known disturbance distance of the species (>300m, NatureScot, 2020), the proposed works are not expected to cause disturbance to the species during the non-breeding season.</p> <p>The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be extremely localised. Hence it is unlikely to affect suitable foraging habitat for the species.</p> <p>Thus, localised temporary disturbance associated with the proposed dredging works is not expected to impact upon the population of the species as a viable component of the SPA, impact the distribution of the species within the SPA, impact the distribution and extent of habitats supporting the species or alter the structure function or supporting processes of habitats supporting the species. Therefore, there will be no deterioration of the habitats utilised by oystercatcher or significant disturbance to oystercatcher. Hence, the integrity of the SPA will be maintained and no LSE to the qualifying interest 'oystercatcher associated with the Dornoch Firth and Loch Fleet SPA', is expected.</p> |

| Qualifying Interest | Summary of Assessment |
|--------------------------------------|--|
| <p>In excess of 20,000 waterfowl</p> | <p>Wintering and breeding waterfowl were identified at the ISB and the adjacent shoreline (within the SPA) during the 2015/16, 2017/18, 2020/21 and 2022/23 winter bird surveys (see Table A1.1) and during the 2016, 2017, 2022 and 2023 breeding bird surveys (Swann & Brockway, 2016; Swann & Brockway, 2017; Atmos, 2022; and Atmos 2023). Due to the close proximity between the proposed works area and the SPA (<100m), there is considered to be potential ecological connectivity between the qualifying interest 'in excess of 20,000 individual waterfowl associated with the Dornoch Firth and Loch Fleet SPA', and the proposed works area.</p> <p>The proposed dredging works are scheduled to be completed prior to April 2024. Hence, no disturbance to breeding waterfowl is expected. Furthermore, disturbance associated with the proposed works is not expected to exceed that of existing ongoing activities at Berths 5 and 6. As no boats will be docking at the berths during the time of works, in-combination effects are not anticipated.</p> <p>The typical disturbance distance of each individual species within the population will vary (NatureScot, 2020). Therefore, it has been assumed that the proposed works area may lie within the disturbance distance of some waterfowl species from the adjacent shoreline. However, the results on the winter bird surveys suggest that the eastern edge of the shoreline (i.e., that closest to the proposed works area) is not particularly favoured by any species (see Table A1.1). It is noted that the total maximum number of individual waterfowl species recorded during a winter bird survey (along the entirety of the shoreline) was 330 (see Table A1.1). Thus, should the species make use of shoreline or marine habitats within a disturbance distance of the proposed works area, the proposed dredging works are only expected to cause localised temporary disturbance to a maximum of approximately 1.65% of the waterfowl population of the SPA (SNH, 2018a). Therefore, localised temporary disturbance associated with the proposed dredging works is not expected to cause significant disturbance to the waterfowl population or impact upon the integrity of the SPA.</p> <p>Furthermore, the proposed works area is not considered to be of optimal foraging suitability for waterfowl due to its existing nature as a vessel berth. Thus, the proposed dredging works are not expected to deteriorate any habitats utilised by the waterfowl species. Hence, no LSE to the qualifying interest 'in excess of 20,000 waterfowl associated with the Dornoch Firth and Loch Fleet SPA', is expected.</p> |

As identified within Table 7.6.2, potential ecological connectivity for eight of the qualifying interests of the Dornoch Firth and Loch Fleet SPA, including bar-tailed godwit, greylag goose, wigeon, curlew, redshank, dunlin, oystercatcher and 'in excess of 20,000 waterfowl' has been identified. However, no LSE due to the proposed dredging works is anticipated for any of the eight qualifying interests. Therefore, **it is advised that the requirement for an AA is unlikely to be applicable to any of the qualifying interests associated with the Dornoch Firth and Loch Fleet SPA.**

7.7 Dornoch Firth and Morrich More SAC

The Dornoch Firth is the most northerly large estuary in Britain and supports a significant proportion of the Inner Moray Firth population of the common seal. The seals, which utilise sandbars and shores at the mouth of the estuary as haul-out and breeding sites, are the most northerly population to utilise sandbanks. Their numbers represent almost 2% of the UK population of the species (JNCC, 2023b).

The conservation objectives for the Dornoch Firth and Morrich More SAC are shown in Table 7.7.1.

Table 7.7.1: Conservation Objectives of the Dornoch Firth and Morrich More SAC

| Conservation Objectives of the European Site |
|--|
| <p>Overarching Conservation Objective:</p> <p>To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying interests.</p> |
| <p>Further Conservation Objectives:</p> <p>To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species. |

Thirteen of the qualifying interests of the Dornoch Firth and Morrich More SAC were screened out from LSE assessment due to a lack of ecological connectivity between the features and the proposed works area (see Section 6.6). However, one of the qualifying interests of the Dornoch Firth and Morrich More SAC was identified to have potential ecological connectivity to the site due the known presence of the species within the Cromarty Firth and the mobile nature of the species. The qualifying interest, common seal, associated with the Dornoch Firth and Morrich More SAC has therefore been taken forward to screening for LSE. The potential for ecological connectivity for the qualifying interest is detailed in Table 7.7.2, alongside an assessment for LSE, with consideration to the conservation objectives of the site, detailed in Table 7.7.1.

Table 7.7.2: Screening for LSE of the Qualifying Interests of the Dornoch Firth and Morrich More SAC

| Qualifying Interest | Summary of Assessment |
|---------------------|---|
| Common seal | <p>Common seal are a mobile feature, and typically travel distances of 50km to forage (Lyons, 2004). In the marine environment, common seal would only need to travel approximately 43km from the Dornoch Firth and Morrich More SAC to reach the ISB and proposed works area. Furthermore, there are records of the species within the Cromarty Firth (NBN, 2023), and there is a designated haul-out site for common seal within the Cromarty Firth, approximately 8.5km from the ISB and proposed works area (Marine Scotland, 2023). Hence, there is considered to be potential ecological connectivity between the qualifying interest 'common seal associated with the Dornoch Firth and Morrich More SAC', and the proposed works area.</p> <p>Due to the depth ranges at which dredging will take place, no potential for accidental injury is anticipated, as common seal are not expected to be present within the proposed works area. The works area does not offer optimal feeding or foraging habitat for common seal.</p> <p>Should common seals be present in the area of the works, evidence from a study within the Inner Moray Firth noted that seals would neither move towards or away from vessels suggesting that these are not a source of disturbance. It notes seals often occupy the same areas as vessels with no apparent changes to their behaviour (Onoufriou et al, 2016). It is therefore anticipated that the works are unlikely to cause disturbance to individuals in the area and therefore unlikely to have any impact on the common seal associated with the Dornoch Firth and Morrich More SAC.</p> <p>The use of the plough dredging technique in waters over 11m deep will only cause increased sediment loading at depth, and sedimentation effects will be localised and temporary. Moreover, it should be noted that common seal often forage in dark and turbid waters, utilising their whiskers to orientate themselves and find prey (Hanke, <i>et al.</i>, 2010). It is therefore unlikely that the small, localised, temporary increase in sedimentation would impair their foraging abilities should they be foraging in the area surrounding the proposed works.</p> <p>Pollutants released into the water as a result of the release of hydraulic oils or fluids from the vessel or a break in machinery could have a negative effect, direct or indirect, on common seal. However, in the unlikely event of a pollution incident, the scale of the event is likely to be too small to affect the designated site and its qualifying features if they were to be present in the area of the works.</p> <p>Furthermore, the proposed works are not expected to generate excessive underwater noise. The main source of noise being the vessel itself, which is not unusual in this area.</p> <p>No LSE to the qualifying interest 'common seal associated with the Dornoch Firth and Morrich More SAC, is therefore expected.</p> |

As identified within Table 7.7.2, potential ecological connectivity for one of the qualifying interests of the Dornoch Firth and Morrich More SAC, common seal, has been identified. However, no LSE due to the proposed dredging works is anticipated for the qualifying interest. Therefore, **it is advised that the requirement for an AA is unlikely to be applicable**

to any of the qualifying interests associated with the Dornoch Firth and Morrich More SAC.

7.8 River Spey SAC

The River Spey supports sea lamprey (*Petromyzon marinus*) (an Annex II species), in the northern part of their range in the UK. Surveys show that sea lamprey larvae are widely distributed throughout the middle and lower reaches of the river, where the fast-flowing waters of the River Spey provide ideal spawning conditions for the species. In addition, the river is unpolluted with minimal modifications. Thus, the river matches key habitat requirements of the sea lamprey in terms of good water quality, clean gravels and marginal silts and unobstructed migration route to the sea (JNCC, 2023h).

The conservation objectives for the River Spey SAC are shown in Table 7.8.1.

Table 7.8.1: Conservation Objectives of the River Spey SAC

| Conservation Objectives of the European Site |
|---|
| <p>Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying interests.</p> |
| <p>Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> • Population of the avoid deterioration of the habitats of the qualifying species or significant disturbance to species, including range of genetic types for salmon, as a viable component of the site; • Distribution of the species within site – Distribution and extent of habitats supporting the species – Structure, function and supporting processes of habitats supporting the species; • No significant disturbance of the species; and • Structure, function and supporting process of habitats supporting freshwater pearl mussel host species. |

Three of the qualifying interests of the River Spey SAC were screened out from LSE assessment due to a lack of ecological connectivity between the features and the proposed works area (see Section 6.8). However, one of the qualifying interests of the River Spey SAC was identified as having potential ecological connectivity due the known presence of the species within the Cromarty Firth and the mobile nature of the species. The qualifying interest, sea lamprey, associated with the River Spey SAC has therefore been taken forward to screening for LSE. The potential for ecological connectivity for the qualifying interest is detailed in Table 7.8.2, alongside an assessment for LSE, with consideration to the conservation objectives of the site, detailed in Table 7.8.1.

Table 7.8.2: Screening for LSE of the Qualifying Interests of the River Spey SAC

| Qualifying Interest | Summary of assessment |
|---------------------|--|
| Sea lamprey | <p>Sea lamprey do not always return to their spawning ground, and instead, utilise sensory organs to identify suitable spawning habitat. The River Conon is a known spawning ground of sea lamprey, and there are records of the species within the Cromarty Firth (O'Reilly <i>et al.</i>, 2016). Thus, there is potential for individuals of sea lamprey from the SAC to migrate within the Cromarty Firth and vice versa. Hence, there is considered to be potential ecological connectivity between the qualifying interest 'sea lamprey associated with the River Spey SAC', and the proposed works area.</p> <p>Hunter <i>et al.</i>, 2014 identified potential threats to sea lamprey due to marine developments including noise, physical injury, and the effect of electromagnetic fields. The proposed dredging works will not result in any creation of electromagnetic fields.</p> <p>In addition, the proposed works area is comprised of soft sediments, thus, noise is likely to dissipate quickly and unlikely to cause any significant underwater noise disturbance to sea lamprey. Physical injury is also unlikely as the works will be temporary and localised, undertaken within areas of high vessel activity which are unlikely to be optimal for lamprey.</p> <p>Pollutants released into the water as a result of the release of hydraulic oils or fluids from the vessel or a break in machinery could have a negative effect, direct or indirect, on sea lamprey. However, in the unlikely event of a pollution incident, the scale of the event is likely to be too small to affect the designated site and its qualifying features if they were to be present in the area of the works.</p> <p>No LSE to the qualifying interest 'sea lamprey associated with the River Spey SAC', is therefore expected.</p> |

As identified within Table 7.8.2, potential ecological connectivity for one of the qualifying interest of the River Spey SAC, sea lamprey, has been identified. However, no LSE due to the proposed dredging works is anticipated for the qualifying interest. Therefore, **it is advised that the requirement for an AA is unlikely to be applicable to any of the qualifying interests associated with the River Spey SAC.**

8 Conclusion

It is proposed to undertake maintenance plough dredge works immediately south of Quay West 1 & 2 (Berths 5 and 6) of the ISB, PoCF in order to maintain the berths' designed depth of -12m CD. As the proposed area of works lies within <500m of a European Site, the Cromarty Firth SPA, detailed considerations of the works required in relation to the Habitats Regulations have been undertaken.

European Sites with qualifying interests associated with the marine, intertidal and riverine environments within the wider locality of the ISB have been assessed to determine whether any of the qualifying interests have potential for ecological connectivity to the proposed works.

Qualifying interests with potential ecological connectivity to the proposed works area have been assessed further for LSE.

With regards to ornithological qualifying interests, the assessment for LSE was undertaken with support of ornithological data collected over several years during winter and breeding bird surveys, completed at the ISB and adjacent shoreline. Furthermore, it is noted that the assessment has been made on the assumption that all detailed dredging works will conclude prior to April 2024, and that, should works continue into this period, a re-assessment for LSE will likely be required.

On assessment of the potential for LSE for any of the qualifying interests with potential ecological connectivity to the site, it has been determined that no LSE is anticipated. Therefore, it is anticipated that an AA will not be necessary. It is, however, up to the competent authority to determine whether there are any LSE, and therefore, whether an AA will be required. Information has been provided within this report to aid the competent authority to inform their decision.

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10 Glossary

| Acronym | Definition |
|---------|--|
| AA | Appropriate Assessment |
| CD | Chart Datum |
| cSAC | Candidate Special Area of Conservation |
| EOMS | European Offshore Marine Site |
| EU | European Union |
| GB | Great Britain |
| HRA | Habitat Regulation Assessment |
| ISB | Invergordon Service Base |
| LSE | Likely Significant Effect |
| m | Metre |
| MHWS | Mean High Water Springs |
| NBN | National Biodiversity Network |
| NE | Northeast |
| NW | Northwest |
| JNCC | Joint Nature Conservation Committee |
| km | Kilometre |
| PoCF | Port of Cromarty Firth |
| pSAC | Proposed Special Area of Conservation |
| pSPA | Proposed Special Protection Area |
| SAC | Special Area of Conservation |
| SNH | Scottish Natural Heritage (now NatureScot) |
| SPA | Special Protection Area |
| SSSI | Site of Special Scientific Interest |
| SST | Sea Surface Temperature |
| UK | United Kingdom |
| W | West |

Appendix 1: Winter Bird Surveys

In order to gain understanding of the ornithological interest of the proposed works site, wintering bird surveys were undertaken between October and March in 2015/16, 2017/18, 2020/21 and 2022/23 by suitable experienced ecologists, Yvonne Brown, Lucy Quinn, Kirsty Macdonald, and Ffion Maguire (respectively). The winter bird surveys were undertaken in line with the methodology provided within 'Bird Monitoring Methods' (Gilbert *et al.*, 2012). The shoreline was divided into ten survey areas, labelled A – J. The location of each survey area is shown in Drawing 71_DRG_9_1. Results of the wintering bird surveys are shown in Table A1.1.

Table A1.1: Counts of Bird Species (Relevant to this HRA Screening Report) Recorded within Each Survey Area (see Figure A1.1) During the Wintering Bird Surveys in 2015/16, 2017/18, 2020/21 and 2022/23

| Species | J | I | H | G | F | E | D | C | B | A | Tide | Month | Year |
|------------------------|---|---|----|---|----|----|----|---|----|---|------|-----------------|---------|
| Curlew | 3 | | 4 | 8 | 2 | | | 1 | | | Low | October | 2015/16 |
| Oystercatcher | 3 | 4 | 8 | 6 | 30 | 29 | | 1 | 3 | | Low | October | 2015/16 |
| Redshank | 3 | | | | | 1 | 1 | | 3 | | Low | October | 2015/16 |
| Curlew | | | | | | 1 | 1 | 1 | | | Mid | October | 2015/16 |
| Oystercatcher | | 1 | | | | 61 | 5 | | | | Mid | October | 2015/16 |
| Redshank | | | | | | | 1 | | 7 | | Mid | October | 2015/16 |
| Oystercatcher | | | | | | 52 | | | | | High | October | 2015/16 |
| Curlew | | 1 | 4 | 1 | 1 | 1 | | 1 | 1 | | Low | November | 2015/16 |
| Oystercatcher | | 2 | 12 | 2 | 4 | 28 | 6 | 7 | 8 | | Low | November | 2015/16 |
| Redshank | | | 1 | 1 | | | 1 | | | | Low | November | 2015/16 |
| Curlew | | | 3 | | | 1 | | 1 | 1 | | Mid | November | 2015/16 |
| Oystercatcher | | | 5 | | 3 | 28 | 25 | 3 | 20 | | Mid | November | 2015/16 |
| Red-breasted merganser | | | | | | | 1 | | | | Mid | November | 2015/16 |
| Redshank | | | | | | | | | 1 | | Mid | November | 2015/16 |
| Curlew | | 1 | | | 1 | | | | 1 | | High | November | 2015/16 |
| Oystercatcher | | 1 | | | 73 | 6 | | | | | High | November | 2015/16 |
| Redshank | 1 | | | | 1 | | | 3 | 2 | | High | November | 2015/16 |
| Curlew | 1 | 1 | | 1 | | | | | 1 | | Low | November 2.0 | 2015/16 |
| Oystercatcher | | 4 | | 8 | 7 | 28 | | | 2 | | Low | November 2.0 | 2015/16 |
| Redshank | | | | 4 | 1 | | | | | | Low | November 2.0 | 2015/16 |

| Species | J | I | H | G | F | E | D | C | B | A | Tide | Month | Year |
|------------------------|---|---|----|---|----|----|----|----|----|---|------|--------------|---------|
| Curlew | | 1 | 1 | | | | | | | | Mid | November 2.0 | 2015/16 |
| Oystercatcher | 1 | 2 | 2 | | | 13 | 22 | 8 | 24 | | Mid | November 2.0 | 2015/16 |
| Redshank | | | | | | | 1 | | 6 | | Mid | November 2.0 | 2015/16 |
| Oystercatcher | | | | | 82 | 7 | | | 6 | | High | November 2.0 | 2015/16 |
| Redshank | | | | | 2 | | | | | | High | November 2.0 | 2015/16 |
| Curlew | | | | 1 | | 1 | 2 | | | | Low | November 3.0 | 2015/16 |
| Oystercatcher | 4 | 6 | 2 | 2 | | 6 | 13 | 4 | 3 | | Low | November 3.0 | 2015/16 |
| Red-breasted merganser | | | 1 | | | | | | | | Low | November 3.0 | 2015/16 |
| Redshank | | | | | | | 1 | | | | Low | November 3.0 | 2015/16 |
| Common eider | | | | 2 | | | | | | | Mid | November 3.0 | 2015/16 |
| Curlew | | 1 | 2 | | | 2 | | | 1 | | Mid | November 3.0 | 2015/16 |
| Oystercatcher | | 4 | 12 | | 16 | 3 | | | 2 | | Mid | November 3.0 | 2015/16 |
| Oystercatcher | | | | | | 29 | 2 | | 39 | | High | November 3.0 | 2015/16 |
| Redshank | | | 2 | | | 1 | | 1 | 1 | | High | November 3.0 | 2015/16 |
| Curlew | | | 2 | | 3 | | | 1 | 1 | | Low | December | 2015/16 |
| Oystercatcher | | 2 | 6 | | 5 | 9 | 2 | 1 | 4 | | Low | December | 2015/16 |
| Oystercatcher | | | 3 | 2 | 26 | 6 | 4 | 10 | 32 | | Mid | December | 2015/16 |
| Redshank | | | | 1 | | | | | 1 | | Mid | December | 2015/16 |
| Oystercatcher | | | | | 67 | 6 | | | 2 | | High | December | 2015/16 |
| Common eider | | | | | 2 | | | | | | Low | December 2.0 | 2015/16 |
| Common goldeneye | | | | | 1 | | | | | | Low | December 2.0 | 2015/16 |
| Curlew | 1 | 1 | 1 | | | 2 | | 2 | 2 | | Low | December 2.0 | 2015/16 |
| European shag | | | | 1 | | | | | | | Low | December 2.0 | 2015/16 |
| Oystercatcher | 1 | 2 | 4 | 6 | 1 | 2 | 17 | | 14 | | Low | December 2.0 | 2015/16 |
| Redshank | | | | | | | | | 4 | | Low | December 2.0 | 2015/16 |
| Curlew | | 1 | 1 | | | | | | | | Mid | December 2.0 | 2015/16 |
| Oystercatcher | | | | | | 41 | | | 18 | | Mid | December 2.0 | 2015/16 |
| Redshank | | | | | | 4 | | 1 | 1 | | Mid | December 2.0 | 2015/16 |
| Oystercatcher | | | | | | 34 | | 6 | 14 | | High | December 2.0 | 2015/16 |
| Redshank | | | 1 | | | 8 | | | | | High | December 2.0 | 2015/16 |
| Curlew | | | 1 | 1 | | 2 | 1 | | 1 | | Low | January | 2015/16 |
| Oystercatcher | 2 | 5 | 5 | 1 | 8 | 12 | 6 | | 4 | | Low | January | 2015/16 |
| Redshank | | | | | 1 | 1 | | | 1 | | Low | January | 2015/16 |
| Curlew | 1 | | | 1 | 1 | | 1 | | | | Mid | January | 2015/16 |
| Oystercatcher | 2 | 2 | 2 | | | 9 | 27 | | 17 | | Mid | January | 2015/16 |

| Species | J | I | H | G | F | E | D | C | B | A | Tide | Month | Year |
|------------------------|---|----|---|----|----|----|----|----|----|---|------|-------------|---------|
| Redshank | | | | | | | 1 | | 1 | | Mid | January | 2015/16 |
| Oystercatcher | 1 | | | | | 27 | | | 61 | | High | January | 2015/16 |
| Redshank | | | | | | | | | 5 | | High | January | 2015/16 |
| Curlew | | 2 | 1 | 3 | 2 | 1 | | | | | Low | January 2.0 | 2015/16 |
| Oystercatcher | 1 | 3 | 5 | 5 | 4 | 33 | 2 | | 2 | | Low | January 2.0 | 2015/16 |
| Red-breasted merganser | 3 | | | | | | | | | | Low | January 2.0 | 2015/16 |
| Redshank | 1 | | | | | 1 | 1 | | | | Low | January 2.0 | 2015/16 |
| Oystercatcher | 1 | | | | | 37 | | 13 | 1 | | Mid | January 2.0 | 2015/16 |
| Redshank | | | | | | 3 | | | | | Mid | January 2.0 | 2015/16 |
| Oystercatcher | | | | | | 27 | | 17 | 14 | | High | January 2.0 | 2015/16 |
| Redshank | | | | | | 2 | | | | | High | January 2.0 | 2015/16 |
| Curlew | | | | 3 | | 1 | 1 | | | 1 | Low | February | 2015/16 |
| Oystercatcher | 3 | 2 | 4 | 6 | 10 | 10 | 12 | 6 | | 8 | Low | February | 2015/16 |
| Redshank | | | | 1 | | 1 | 1 | | | 1 | Low | February | 2015/16 |
| Curlew | 1 | 24 | 2 | 1 | 1 | 1 | | | | | Mid | February | 2015/16 |
| Oystercatcher | 1 | 5 | 5 | 4 | 2 | 45 | | | 10 | | Mid | February | 2015/16 |
| Redshank | | 1 | 5 | | | 9 | | | 2 | | Mid | February | 2015/16 |
| Curlew | | | | | | 4 | 1 | | | | High | February | 2015/16 |
| Oystercatcher | | | | | | 46 | 10 | | | | High | February | 2015/16 |
| Common eider | | | 2 | | | | | | | | Low | March | 2015/16 |
| Common goldeneye | | | 3 | | | | | | | | Low | March | 2015/16 |
| Cormorant | | | 1 | | | | | | | | Low | March | 2015/16 |
| Curlew | 1 | 1 | | 2 | 2 | | 1 | 1 | | | Low | March | 2015/16 |
| Oystercatcher | 1 | 2 | 2 | 38 | 7 | 54 | | 1 | 2 | | Low | March | 2015/16 |
| Red-breasted merganser | | | | | | | | | | 3 | Low | March | 2015/16 |
| Redshank | 1 | | | 1 | | | 2 | | | | Low | March | 2015/16 |
| Curlew | 1 | | | | | | | | | | Mid | March | 2015/16 |
| Oystercatcher | 1 | 3 | | 2 | | 56 | | | 4 | | Mid | March | 2015/16 |
| Redshank | 1 | | | | | | | | | | Mid | March | 2015/16 |
| Curlew | | 1 | | | | | | | | | High | March | 2015/16 |
| Oystercatcher | | 6 | | | 7 | 50 | | | 2 | | High | March | 2015/16 |
| Redshank | 1 | | | | | 1 | | | | | High | March | 2015/16 |
| Common goldeneye | | | 1 | 4 | | | | | | | Mid | December | 2017/18 |
| Cormorant | | | 1 | | 1 | | | | | | Mid | December | 2017/18 |

| Species | J | I | H | G | F | E | D | C | B | A | Tide | Month | Year |
|------------------------|---|----|----|---|----|----|---|---|----|---|------|----------|---------|
| Curlew | | | | | | | | | 5 | | Mid | December | 2017/18 |
| Oystercatcher | 3 | 1 | | | | 8 | | | 32 | | Mid | December | 2017/18 |
| Redshank | | | 1 | | | 9 | | | 2 | | Mid | December | 2017/18 |
| Cormorant | | 1 | | 1 | | | | | | | Mid | January | 2017/18 |
| Curlew | | 1 | 1 | | 1 | 1 | | | | | Mid | January | 2017/18 |
| Dunlin | | 20 | | | | | | | | | Mid | January | 2017/18 |
| Oystercatcher | | 16 | | | 57 | | | | | | Mid | January | 2017/18 |
| Redshank | | | 1 | | 7 | | | | 2 | | Mid | January | 2017/18 |
| Bar-tailed godwit | | | | | | 1 | | | | | Mid | February | 2017/18 |
| Curlew | | 1 | 1 | | 1 | 1 | | | | | Mid | February | 2017/18 |
| Oystercatcher | | 13 | 4 | 1 | 8 | 11 | | | | | Mid | February | 2017/18 |
| Redshank | | | | | 2 | | | | | | Mid | February | 2017/18 |
| Common eider | | | | 1 | | | | | | | Mid | March | 2017/18 |
| Curlew | | 1 | 1 | | | | 1 | | | | Mid | March | 2017/18 |
| Oystercatcher | | 38 | 11 | | | 12 | 2 | | 24 | | Mid | March | 2017/18 |
| Redshank | | 4 | 3 | 1 | 1 | 9 | | | | | Mid | March | 2017/18 |
| Common goldeneye | | | | | | | | | | 1 | Low | November | 2020/21 |
| Curlew | | | | | | | | 2 | 2 | | Low | November | 2020/21 |
| Oystercatcher | | 1 | 5 | 2 | 3 | 9 | 1 | 1 | 12 | | Low | November | 2020/21 |
| Redshank | | | | | | | | | 4 | | Low | November | 2020/21 |
| Curlew | | | | 1 | 1 | | 1 | | 11 | | Mid | November | 2020/21 |
| Oystercatcher | | 2 | 5 | 4 | | 20 | 5 | | 8 | | Mid | November | 2020/21 |
| Common goldeneye | | | | | | | | | 1 | | High | November | 2020/21 |
| Cormorant | | | | 1 | | | | | | | High | November | 2020/21 |
| Curlew | | 3 | | | | | | | | | High | November | 2020/21 |
| Oystercatcher | | | | | | | | | 52 | | High | November | 2020/21 |
| Red-breasted merganser | | | | | | | | | 2 | | High | November | 2020/21 |
| Redshank | | 1 | | | | | | | | | High | November | 2020/21 |
| Common eider | | | | 1 | | | | | | | Low | December | 2020/21 |
| Curlew | 1 | | 1 | 2 | 1 | 1 | | 1 | 2 | | Low | December | 2020/21 |
| Oystercatcher | | 2 | 7 | 5 | 2 | 7 | 5 | 3 | 10 | | Low | December | 2020/21 |
| Common eider | | 1 | | | 1 | 1 | | | | | Mid | December | 2020/21 |
| Common goldeneye | | | | | | | | | 1 | | Mid | December | 2020/21 |
| Curlew | 1 | | 1 | 1 | | | 1 | | 1 | | Mid | December | 2020/21 |
| Oystercatcher | 2 | 6 | 2 | 1 | | 13 | 1 | | 19 | | Mid | December | 2020/21 |

| Species | J | I | H | G | F | E | D | C | B | A | Tide | Month | Year |
|------------------|---|----|---|---|---|----|----|----|----|---|------|-----------|---------|
| Common eider | | | | | | | 1 | | | | High | December | 2020/21 |
| Common goldeneye | | | | 1 | | | | | | | High | December | 2020/21 |
| Goosander | | | | | | | 1 | | | | High | December | 2020/21 |
| Oystercatcher | | | | | | 13 | 17 | 26 | 10 | | High | December | 2020/21 |
| Curlew | | 2 | 1 | 1 | 2 | 1 | 1 | 1 | | | Low | January | 2020/21 |
| Oystercatcher | 1 | 8 | 1 | 4 | | 4 | 2 | 2 | 2 | | Low | January | 2020/21 |
| Redshank | | | 1 | 1 | | | | | | | Low | January | 2020/21 |
| Curlew | | | 1 | 2 | 1 | 2 | 2 | | 2 | | Mid | January | 2020/21 |
| Oystercatcher | 2 | 6 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | | Mid | January | 2020/21 |
| Redshank | | | 1 | | | | | | 2 | | Mid | January | 2020/21 |
| Curlew | | 1 | | | | | | | | | High | January | 2020/21 |
| Oystercatcher | | 15 | | | | 9 | | | 4 | | High | January | 2020/21 |
| Curlew | | | | | 1 | 1 | 1 | | 1 | | Low | February | 2020/21 |
| Oystercatcher | | 1 | 4 | 4 | | | 9 | 9 | 1 | | Low | February | 2020/21 |
| Curlew | 1 | | | | | 1 | | | | | Mid | February | 2020/21 |
| Oystercatcher | 2 | | | | | | 1 | 17 | 2 | | Mid | February | 2020/21 |
| Curlew | | | | | | 1 | | | | | High | February | 2020/21 |
| Oystercatcher | | | 3 | | | | | 4 | 32 | | High | February | 2020/21 |
| Curlew | | | | | | | 2 | 2 | 1 | | Low | March | 2020/21 |
| Oystercatcher | | 1 | 3 | | | 5 | 5 | 7 | 2 | | Low | March | 2020/21 |
| Wigeon | | | | | 1 | | | | | | Low | March | 2020/21 |
| Curlew | | 1 | 1 | | | 3 | | 1 | | | Mid | March | 2020/21 |
| Oystercatcher | | 8 | 5 | | | | 1 | 15 | | | Mid | March | 2020/21 |
| Redshank | | 1 | | 1 | | | | | | | Mid | March | 2020/21 |
| Wigeon | | | | | 1 | | | | | | Mid | March | 2020/21 |
| Curlew | | 1 | 1 | | | 2 | | | | | High | March | 2020/21 |
| Oystercatcher | | 10 | 5 | | | 4 | | | 19 | | High | March | 2020/21 |
| Redshank | | | 2 | | | 6 | | | | | High | March | 2020/21 |
| Wigeon | | | | | | 1 | | | | | High | March | 2020/21 |
| Common eider | | | | 1 | | 16 | | | | | Low | March 2.0 | 2020/21 |
| Common goldeneye | | | | | | | | | | 3 | Low | March 2.0 | 2020/21 |
| Curlew | | 2 | | 2 | 1 | 2 | 1 | 1 | 1 | | Low | March 2.0 | 2020/21 |
| Oystercatcher | | | 7 | 5 | 1 | 4 | 9 | 2 | 1 | | Low | March 2.0 | 2020/21 |
| Curlew | | | 1 | | | | | | | | Mid | March 2.0 | 2020/21 |
| Oystercatcher | 1 | 9 | 5 | 2 | 1 | | | 1 | 5 | | Mid | March 2.0 | 2020/21 |

| Species | J | I | H | G | F | E | D | C | B | A | Tide | Month | Year |
|------------------|---|----|----|----|----|----|---|---|----|----|------|-----------|---------|
| Redshank | | | | 4 | | | | | 2 | | Mid | March 2.0 | 2020/21 |
| Common goldeneye | | | | 2 | | | | | | | High | March 2.0 | 2020/21 |
| Oystercatcher | | | 12 | 3 | | 2 | | | 1 | | High | March 2.0 | 2020/21 |
| Curlew | 1 | | | | | | | 2 | | | Low | October | 2022/23 |
| European shag | | | | 1 | | | | | | | Low | October | 2022/23 |
| Oystercatcher | 3 | 1 | | | | 4 | | | 19 | 22 | Low | October | 2022/23 |
| Redshank | | | | | | | | | 1 | | Low | October | 2022/23 |
| Curlew | | 1 | 1 | | 1 | | 1 | | | | Mid | October | 2022/23 |
| European shag | | | 3 | | | | | | | | Mid | October | 2022/23 |
| Oystercatcher | | 2 | 3 | | | | | | 19 | | Mid | October | 2022/23 |
| Common eider | | | | | | | | | | 1 | High | October | 2022/23 |
| Curlew | | | | | | 1 | | 1 | | | High | October | 2022/23 |
| European shag | | | | 1 | 1 | | | | | | High | October | 2022/23 |
| Oystercatcher | 2 | | | 8 | 6 | 16 | 1 | | 37 | | High | October | 2022/23 |
| Redshank | | | | 2 | | 1 | | | | | High | October | 2022/23 |
| Common eider | | | 1 | 1 | | | | | | | Low | November | 2022/23 |
| Curlew | | 1 | | | 3 | | 1 | | 1 | | Low | November | 2022/23 |
| European shag | | | 1 | | 1 | | | | | | Low | November | 2022/23 |
| Oystercatcher | 3 | 3 | 2 | | 4 | 3 | 1 | | 18 | 8 | Low | November | 2022/23 |
| Common eider | | | | | | | | | 2 | | Mid | November | 2022/23 |
| European shag | 1 | | | | | | | | | | Mid | November | 2022/23 |
| Oystercatcher | | | 1 | | | | | | 30 | | Mid | November | 2022/23 |
| Curlew | | 1 | | | 1 | | | | | | High | November | 2022/23 |
| Oystercatcher | 1 | | | | 30 | | | 1 | | | High | November | 2022/23 |
| Redshank | | | | | 1 | | | | | | High | November | 2022/23 |
| Curlew | | | | 2 | | 1 | 1 | 1 | | | Low | January | 2022/23 |
| Dunlin | | | | | | | | 1 | | | Low | January | 2022/23 |
| European shag | | | 1 | | | | | | | | Low | January | 2022/23 |
| Oystercatcher | 3 | 11 | 5 | 17 | 5 | 5 | 6 | 1 | | | Low | January | 2022/23 |
| Redshank | | | 3 | | | | | | | | Low | January | 2022/23 |
| Curlew | 1 | | | | | | | | | | Mid | January | 2022/23 |
| Greylag goose | | | | 1 | | | | | | | Mid | January | 2022/23 |
| Oystercatcher | 6 | 2 | | | 29 | | | | | | Mid | January | 2022/23 |
| Redshank | 1 | | | | | | | | | | Mid | January | 2022/23 |
| Wigeon | | | 1 | | | | | | | | Mid | January | 2022/23 |

| Species | J | I | H | G | F | E | D | C | B | A | Tide | Month | Year |
|------------------|----|----|---|---|---|---|---|---|----|---|------|--------------|---------|
| Oystercatcher | | | | | | 1 | | | 20 | | High | January | 2022/23 |
| Common eider | | | 2 | | | | | | | | Low | February | 2022/23 |
| Curlew | | 1 | 1 | | 4 | | | | | | Low | February | 2022/23 |
| European shag | | | | 1 | | | | | | | Low | February | 2022/23 |
| Oystercatcher | | 6 | 3 | 1 | 7 | 2 | 3 | | | | Low | February | 2022/23 |
| Redshank | | 1 | 5 | | 4 | | | | | | Low | February | 2022/23 |
| Common eider | 4 | | | | | | | | | | Mid | February | 2022/23 |
| Common goldeneye | | | | 2 | | | | | | | Mid | February | 2022/23 |
| Cormorant | | | | 1 | | | | | | | Mid | February | 2022/23 |
| Curlew | | 1 | 1 | | 1 | 1 | | | | | Mid | February | 2022/23 |
| Oystercatcher | 3 | 7 | 5 | | 1 | 4 | 2 | | 6 | | Mid | February | 2022/23 |
| Redshank | | | 1 | | 9 | 5 | | | 2 | | Mid | February | 2022/23 |
| Common goldeneye | | | 2 | | | | | | | | High | February | 2022/23 |
| Curlew | 1 | 1 | 1 | | 1 | 1 | | | | | High | February | 2022/23 |
| Oystercatcher | 9 | 2 | 1 | | | | | | 29 | | High | February | 2022/23 |
| Redshank | 2 | | | | 6 | | 2 | | | | High | February | 2022/23 |
| Cormorant | | | 1 | | | | | | | | Low | February 2.0 | 2022/23 |
| Curlew | 1 | 1 | 1 | 2 | 1 | | | | | | Low | February 2.0 | 2022/23 |
| European shag | | | | 1 | | | | | | | Low | February 2.0 | 2022/23 |
| Oystercatcher | 7 | 5 | 1 | 5 | 5 | 1 | 2 | 2 | 4 | | Low | February 2.0 | 2022/23 |
| Redshank | | | 1 | | | | | | | | Low | February 2.0 | 2022/23 |
| Oystercatcher | 11 | 5 | 4 | | | | | | 13 | | Mid | February 2.0 | 2022/23 |
| Oystercatcher | | 3 | 3 | | | | | | 1 | 6 | High | February 2.0 | 2022/23 |
| Curlew | | 1 | | 1 | 2 | | | | | | Low | March | 2022/23 |
| European shag | | | | 1 | | | | | | | Low | March | 2022/23 |
| Oystercatcher | 6 | 6 | | 3 | 1 | | 2 | | | | Low | March | 2022/23 |
| Curlew | | | | | 1 | | | | | | Mid | March | 2022/23 |
| Oystercatcher | 4 | 1 | 5 | | 7 | 1 | | | 12 | | Mid | March | 2022/23 |
| Common eider | | | | 1 | | | | 1 | | | High | March | 2022/23 |
| Common goldeneye | | | 1 | 1 | | | | | | | High | March | 2022/23 |
| Oystercatcher | 6 | 10 | | | 4 | | 2 | 1 | 14 | | High | March | 2022/23 |

Drawings

71_DRG_9_1

Registered Office:
Lochview Office, Loch Duntelchaig
Farr, Inverness, IV2 6AW

Telephone: 01808 521 498
Email: info@affriclimited.co.uk
www.affriclimited.co.uk





Title: 71_DRG_9_1 Bird Survey Sections

Projection: OSGB 1936/British National Grid
EPSG:27700

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Legend

-  Bird Survey Sections
-  Foreshore
-  Tidal Water
-  Woodland

