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MARINE DIRECTORATE - LICENSING OPERATIONS TEAM'S ASSESSMENT OF THE PROJECT'S IMPLICATIONS FOR DESIGNATED SPECIAL AREAS OF CONSERVATION AND SPECIAL PROTECTION AREAS IN VIEW OF THE SITES' CONSERVATION OBJECTIVES.

APPLICATION FOR MARINE LICENCES UNDER THE MARINE (SCOTLAND) ACT 2010 AND A SECTION 36 CONSENT UNDER THE ELECTRICITY ACT 1989 FOR THE CONSTRUCTION AND OPERATION OF UP TO SEVEN WIND TURBINE GENERATORS AND ASSOCIATED ANCILLARY WORKS

SITE DETAILS: PENTLAND FIRTH, CAITHNESS

Name	Assessor or Approver	Date
Marc MacFarlane	Assessor	1 June 2023
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Gayle Holland	Approver	7 June 2023

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SECTION 1: BACKGROUND

1 Appropriate assessment conclusion

1.1 This appropriate assessment ("AA") concludes that there will be no adverse effect on the site integrity of the Faray and Holm of Faray Special Area of Conservation ("SAC"), Inner Hebrides and the Minches SAC, Sanday SAC, Moray Firth SAC, River Thurso SAC, River Naver SAC, River Borgie SAC, Berriedale and Langwell Waters SAC, River Spey SAC, Little Gruinard River SAC, River Oykel SAC, Langavat SAC, North Harris SAC, River Dee SAC, River Moriston SAC, River South Esk SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC, River Bladnoch SAC, Caithness and Sutherland Peatlands Special Protection Area ("SPA"), Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA, and Ailsa Craig SPA from the Highland Wind Limited ("HWL") proposal in isolation or in combination with other plans or projects for a 10 year operational period, providing that the conditions set out in Section 4 are complied with.

1.2 There will be no adverse effect on the site integrity of the North Caithness Cliffs SPA with respect to the kittiwake and puffin qualifying interests from the HWL proposal for a 10 year operational period either in isolation or in combination with other plans or projects providing that the conditions set out in Section 4 are complied with.

1.3 Marine Directorate – Licensing Operations Team ("MD-LOT"), formally known as Marine Scotland – Licensing Operations Team ("MS-LOT"), considers that the most up to date and best scientific advice available has been used in reaching the conclusion that the HWL proposal will not adversely affect the integrity of the above sites and is satisfied that no reasonable scientific doubt remains.

2 Introduction

2.1 This is a record of the AA undertaken by MD-LOT (on behalf of the Scottish Ministers) in regards to the HWL proposal to construct and operate a floating offshore wind farm and associated offshore transmission infrastructure as required under Regulation 48 of the Conservation (Natural Habitats, &c.) Regulations 1994 and regulation 63 of the Conservation of Habitats and Species Regulations 2017 (together, "the Habitats Regulations"). The Scottish Ministers, as the 'competent authority under the Habitats Regulations, must be satisfied that the project will not adversely affect the integrity of any

European site (SAC and SPA), either alone or in combination with other plans or projects, before it can grant consent for the project.

2.2 NatureScot, operating name of Scottish Natural Heritage, has been consulted. Specialist advice was also sought and received from Marine Scotland Science ("MSS").

3 Details of proposed project

3.1 HWL propose to construct a floating wind farm with an installed capacity of up to 100 megawatts ("MW") in a site within the Pentland Firth, approximately 7.5 kilometres ("km") seaward of mean high water springs ("MHWS") at Dounreay, Caithness, at its closest point to shore. See figure below for further details.

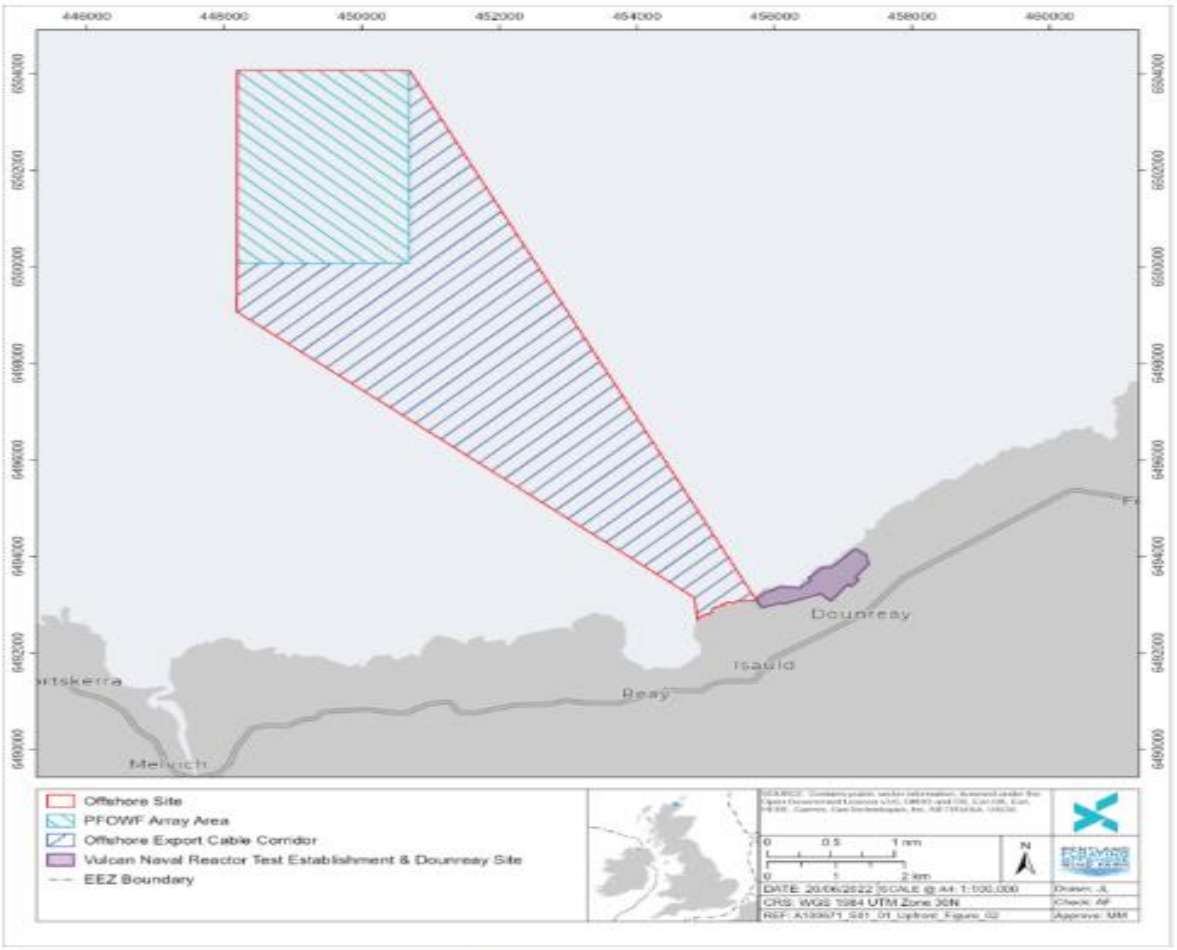

Figure 5.1 Offshore Development boundary

3.2 The array area of the HWL proposal will occupy approximately 10 square kilometres ("km^2") and is to contain up to seven floating offshore wind turbine generators ("WTGs") and associated floating substructures, 63 mooring lines and anchors or piles (nine for each substructure), seven inter-array cables with dynamic and static portions. The WTGs will have a minimum air gap of 35 metres ("m"), maximum hub height of 190m, maximum rotor diameter of 260m and maximum tip height of 300m with an 800m minimum spacing

between WTGs. The voltage level of inter-array cables will be no more than 110 kilovolts ("kV") with a maximum cable diameter of 300 millimetres. The maximum length of inter-array cables will be 25km, up to 20km of which will be on the seabed. Trench-width will be up to 3m with a target-depth of 0.6-1.5m. Each cable will be held down by up to two anchors between WTGs.

3.3 The offshore export cable corridor will comprise up to two offshore export cables, also with a maximum voltage of 110kV. Each cable will be up to 12.5km in length and, ideally, entirely buried to a depth of 0.6-1.5m with a maximum trench width of 3m, but it is estimated up to 50% may require additional protection. This protection may consist of rock placement, concrete mattresses, sand/grout bags, filter unit/rock bags, frond mats and/or partial backfill using previously excavated seabed materials.

3.4 As part of the HWL proposal, pre and post-installation geophysical and geotechnical surveys will be carried out along the cable route. The former will include the use of a remote operated vehicle, swathe bathymetry, side scan sonar ("SSS") and a magnetometer. Furthermore, an unexploded ordnance ("UXO") survey will be carried out during summer 2022 to identify any UXO that may need to be avoided. This will require a magnetometer and possibly a multi-beam echosounder and SSS.

3.5 Offshore construction activities for the HWL proposal are anticipated to commence in 2024 with the horizontal directional drilling works at landfall. Installation of offshore components is then likely to be completed over two, seven month stages. Stages 1 is anticipated to commence in spring 2025 with a winter break before moving onto Stage 2 in spring/summer 2026. It is planned for Stage 1 to see export cable and anchor installation as well as a single WTG. Moorings and inter-array cables, along with the remaining WTGs, will be installed in Stage 2. Based on Figure 5.16 in the EIA Report, it is anticipated that construction will take place over a 30 month period, with up to 19 months of active construction during this time. The application for the HWL proposal was for an operational period of 30 years.

4 Consultation

4.1 NatureScot and RSPB Scotland were consulted on 24 August 2022 and responded, respectively, on 13 October 2022 and 5 October 2022. Specialist advice was sought from MSS on 21 October 2022 and received on 31 October 2022.

4.2 Subsequently, the requirement for additional information was triggered and an "addendum report" was issued for consultation on 19 December 2022. NatureScot and RSPB Scotland responded to this on 23 and 20 February 2023, respectively.

4.3 Confirmation of the full list of SPAs facing likely significant effects ("LSE") from the HWL proposal was sought from NatureScot on 24 February 2023. NatureScot responded on 24 February 2023.

4.4 HWL identified the potential for LSE on European sites out with Scotland. The relevant statutory nature conservation bodies for these sites were consulted and no LSE was advised. Therefore these sites are not included in the AA.

5 Main points raised during consultation.

5.1 NatureScot in its advice dated 13 October 2022, advised that the HWL proposal could have a likely significant effect on the qualifying interests listed in paragraph 7.2 of the Faray and Holm of Faray SAC, Inner Hebrides and the Minches SAC, Sanday SAC, Moray Firth SAC, River Thurso SAC, River Naver SAC, River Borgie SAC, Berriedale and Langwell Waters SAC, River Spey SAC, Little Gruinard River SAC, River Oykel SAC, Langavat SAC, North Harris SAC, River Dee SAC, River Moriston SAC, River South Esk SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC and River Bladnoch SAC.

5.2 As such, NatureScot advised that an AA is required.

5.3 NatureScot agreed with the developer's conclusions of "no adverse effect on site integrity or conservation objectives" in the Habitat Regulations Appraisal ("HRA") Report for marine mammals & other megafauna and migratory fish qualifying interests.

5.4 NatureScot in its response dated 24 February 2023, advised that the HWL proposal could have a likely significant effect on the qualifying interests of North Caithness Cliffs SPA, Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA, and Ailsa Craig SPA listed in paragraph 7.2 of this AA.

5.5 As such, NatureScot advised that an AA is required.

5.6 NatureScot in its response dated 23 February 2023, concluded that the HWL proposal on its own will not result in an adverse effect on site integrity to any SPA. However, in combination with consented offshore wind farms in the Moray Firth, NatureScot advised that the HWL proposal (for a 25 year operational period) will have an adverse effect on site integrity for the puffin qualifying feature of the North Caithness Cliffs SPA. Additionally, NatureScot advised that the HWL proposal, in combination with offshore wind farms in the North Sea, could have an adverse effect on site integrity for the kittiwake qualifying feature of the North Caithness Cliffs SPA.

5.7 NatureScot noted that kittiwake populations across the UK are undergoing a steep decline, even without predicted offshore wind farm impacts. NatureScot advised that this population decline indicates the need for urgent conservation action, in addition to any actions that may be considered as part of the derogation cases for offshore wind farms. Additionally, NatureScot noted that highly pathogenic avian influenza ("HPAI") impacts have not been considered quantitatively for any seabird species, but that puffin and kittiwake may be subject to pressures from this outbreak and the UK population may have very little resilience to the disease.

5.8 Following further consideration of the HWL proposal for a 10 year operational period, NatureScot advised in its response of 14 March 2023 that that there would be no adverse effect on the site integrity of North Caithness Cliffs SPA with respect to puffin and kittiwake when the HWL proposal is considered in combination with the Moray Firth offshore wind farms. On 27 March 2023 NatureScot advised that for a 10 year operational period the HWL proposal could adversely affect the North Caithness Cliffs SPA with respect to kittiwake when considered in combination with the Moray Firth and other North Sea offshore wind farms.

5.9 RSPB Scotland, in its response of 20 February 2023, maintained its objection to the Project, in combination with Moray Firth offshore wind farms, due to breeding season impacts on the site integrity for the kittiwake qualifying feature of the North Caithness Cliffs SPA. RSPB Scotland stated that in the context of the catastrophic decline in Scottish kittiwake populations and the additional potential impact of HPAI, this is an unacceptable impact.

5.10 Additionally, RSPB Scotland maintained its objection to the HWL, in combination with Moray Firth wind farms due to breeding season impacts on the site integrity for the puffin qualifying feature of the North Caithness Cliffs SPA. RSPB Scotland advised that, on the basis of information available, the impacts to puffin alone and in combination are unacceptable. As such, it is RSPB Scotland's advice that the Project would have an adverse impact on site integrity with regard to the North Caithness Cliffs SPA.

SECTION 2: INFORMATION ON EUROPEAN SITES

6 Background information and qualifying interests for the relevant European site

6.1 This section provides links to the NatureScot SiteLink website ("SiteLink") where the background information on the site being considered in this assessment is available. The qualifying interests for the site are listed as are the conservation objectives.

Table 1 Name of European site affected and relevant link(s) to SiteLink.

Faray and Holm of Faray SAC
Inner Hebrides and the Minches SAC

Sanday SAC

Moray Firth SAC

River Thurso SAC

River Naver SAC

River Borgie SAC

Berriedale and Langwell Waters SAC

River Spey SAC

Little Gruinard River SAC

River Oykel SAC

Langavat SAC

North Harris SAC

River Dee SAC

River Moriston SAC

River South Esk SAC

River Tay SAC

River Tweed SAC

River Teith SAC

Endrick Water SAC

River Bladnoch SAC

North Caithness Cliffs SPA

Caithness and Sutherland Peatlands SPA

Hoy SPA

Cape Wrath SPA

Sule Skerry and Sule Stack SPA

Marwick Head SPA

East Caithness Cliffs SPA

Copinsay SPA

Rousay SPA

West Westray SPA

Auskerry SPA

Handa SPA

Calf of Eday SPA

Priest Island SPA

North Rona and Sula Sgeir SPA

Fair Isle SPA

Troup, Pennan and Lion's Heads SPA

Foula SPA

Buchan Ness to Collieston Coast SPA

Sumburgh Head SPA

Mousa SPA

Flannan Isles SPA

Noss SPA

Ramna Stacks and Gruney SPA

Fowlsheugh SPA

Canna and Sanday SPA

Rum SPA

Fetlar SPA

Hermaness, Saxa Vord and Valla Field SPA

St. Kilda SPA

Mingulay and Berberay SPA

Forth Islands SPA

Ailsa Craig SPA

Table 2 Qualifying interests.

Faray and Holm of Faray SAC

- Grey seal (*Halichoerus grypus*)

Inner Hebrides and the Minches SAC

- Harbour porpoise (*Phocoena phocoena*)

Sanday SAC

- Harbour seal (*Phoca vitulina*)
- Intertidal mudflats and sandflats
- Reefs
- Subtidal sandbanks

Moray Firth SAC

- Bottlenose dolphin (*Tursiops truncatus*)
- Subtidal sandbanks

River Thurso SAC

- Atlantic salmon (*Salmo salar*)

River Naver SAC

- Atlantic salmon (*Salmo salar*)

River Borgie SAC

- Atlantic salmon (*Salmo salar*)
- Freshwater pearl mussel (*Margaritifera margaritifera*)
  [Redacted]

Berriedale and Langwell Waters SAC

- Atlantic salmon (*Salmo salar*)

River Spey SAC

- Atlantic salmon (*Salmo salar*)
- Freshwater pearl mussel (*Margaritifera margaritifera*)
  [Redacted]
- Sea lamprey (*Petromyzon marinus*)

Little Gruinard River SAC

- Atlantic salmon (*Salmo salar*)

River Oykel SAC

- Atlantic salmon (*Salmo salar*)
- Freshwater pearl mussel (*Margaritifera margaritifera*)

Langavat SAC

- Atlantic salmon (*Salmo salar*)

North Harris SAC

- Acid peat-stained lakes and ponds
- Acidic scree
- Alpine and subalpine heaths
- Atlantic salmon (*Salmo salar*)
- Blanket bog
- Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels
- Depression on peat substrates
- Dry heaths
- Freshwater pearl mussel (*Margaritifera margaritifera*)
- Montane acid grasslands

[Redacted]

- Plants in crevices on acid rocks
- Wet heathlands with cross-leaved heath

River Dee SAC

- Atlantic salmon (*Salmo salar*)
- Freshwater pearl mussel (*Margaritifera margaritifera*)

[Redacted]

River Moriston SAC

- Atlantic salmon (*Salmo salar*)
- Freshwater pearl mussel (*Margaritifera margaritifera*)

River South Esk SAC

- Atlantic salmon (*Salmo salar*)
- Freshwater pearl mussel (*Margaritifera margaritifera*)

River Tay SAC

- Atlantic salmon (*Salmo salar*)
- Brook lamprey (*Lampetra planeri*)
- Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels

[Redacted]

- River lamprey (*Lampetra fluviatilis*)
- Sea lamprey (*Petromyzon marinus*)

River Tweed SAC

- Atlantic salmon (*Salmo salar*)
- Brook lamprey (*Lampetra planeri*)

[Redacted]

- River lamprey (*Lampetra fluviatilis*)
- Rivers with floating often dominated by water-crowfoot.
- Sea lamprey (*Petromyzon marinus*)

River Teith SAC

- Atlantic salmon (*Salmo salar*)
- Brook lamprey (*Lampetra planeri*)
- River lamprey (*Lampetra fluviatilis*)
- Sea lamprey (*Petromyzon marinus*)

Endrick Water SAC

- Atlantic salmon (*Salmo salar*)
- Brook lamprey (*Lampetra planeri*)
- River lamprey (*Lampetra fluviatilis*)

River Bladnoch SAC

- Atlantic salmon (*Salmo salar*)

North Caithness Cliffs SPA

- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*)
- Kittiwake (*Rissa tridactyla*) *

[Redacted]

- Puffin (*Fratercula arctica*) *
- Razorbill (*Alca torda*) *
- Seabird assemblage
- * indicates assemblage qualifier only

Caithness and Sutherland Peatlands SPA

[Redacted]

[Redacted]

- Dunlin (*Calidris alpina schinzii*)

[Redacted]

- Golden plover (*Pluvialis apricaria*)

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

- Wigeon (*Anas penelope*)

[Redacted]

Hoy SPA

- Arctic skua (*Stercorarius parasiticus*) *
- Fulmar (*Fulmarus glacialis*) *
- Great black-backed gull (*Larus marinus*) *
- Great skua (*Catharacta skua*)
- Guillemot (*Uria aalge*) *
- Kittiwake (*Rissa tridactyla*) *

[Redacted]

- Puffin (*Fratecula arctica*) *
- Red-throated diver (*Gavia stellata*)
- Seabird assemblage
- * indicates assemblage qualifier only

Cape Wrath SPA

- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*) *
- Kittiwake (*Rissa tridactyla*) *
- Puffin (*Fratercula arctica*) *
- Razorbill (*Alca torda*) *
- Seabird assemblage
- * indicates assemblage qualifier only

Sule Skerry and Sule Stack SPA

- Gannet (*Morus bassanus*)
- Guillemot (*Uria aalge*) *
- Leach's petrel (*Oceanodroma leucorhoa*)
- Puffin (*Fratercula arctica*)
- Shag (*Phalocrocorax aristotelis*) *
- Storm petrel (*Hydrobates pelagicus*)
- Seabird assemblage
- *indicates assemblage qualifier only

Marwick Head SPA

- Guillemot (*Uria aalge*)
- Kittiwake (*Rissa tridactyla*) *
- Seabird assemblage
- *indicates assemblage qualifier only

East Caithness Cliffs SPA

- Cormorant (*Phalacrocorax carbo*) *
- Fulmar (*Fulmarus glacialis*) *
- Great black-backed gull (*Larus marinus*) *
- Guillemot (*Uria aalge*)
- Herring gull (*Larus argentatus*)
- Kittiwake (*Rissa tridactyla*)

[Redacted]

- Razorbill (*Alca torda*)
- Shag (*Phalacrocorax aristotelis*)
- Seabird assemblage
- *indicates assemblage qualifier only

Copinsay SPA

- Fulmar (*Fulmarus glacialis*) *
- Great black-backed gull (*Larus marinus*) *
- Guillemot (*Uria aalge*) *
- Kittiwake (*Rissa tridactyla*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Rousay SPA

- Arctic skua (*Stercorarius parasiticus*) *
- Arctic tern (*Sterna paradisaea*)
- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*) *
- Kittiwake (*Rissa tridactyla*) *
- Seabird assemblage
- *indicates assemblage qualifier only

West Westray SPA

- Arctic skua (*Stercorarius parasiticus*) *
- Arctic tern (*Sterna paradisaea*)
- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*)
- Kittiwake (*Rissa tridactyla*) *
- Razorbill (*Alca torda*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Auskerry SPA

- Arctic tern (*Sterna paradisaea*)

- Storm petrel (*Hydrobates pelagicus*)

Handa SPA

- Fulmar (*Fulmarus glacialis*) *
- Great skua (*Catharacta skua*) *
- Guillemot (*Uria aalge*)
- Kittiwake (*Rissa tridactyla*) *
- Razorbill (*Alca torda*)
- Seabird assemblage
- *indicates assemblage qualifier only

Calf of Eday SPA

- • Cormorant (*Phalacrocorax carbo carbo*) *
- • Fulmar (*Fulmarus glacialis*) *
- • Great black-backed gull (*Larus marinus*) *
- • Guillemot (*Uria aalge*) *
- • Kittiwake (*Rissa tridactyla*) *
- • Seabird assemblage
- *indicates assemblage qualifier only

Priest Island SPA

- Storm petrel (*Hydrobates pelagicus*)

North Rona and Sula Sgeir SPA

- • Fulmar (*Fulmarus glacialis*) *
- • Gannet (*Morus bassanus*)
- • Great black-backed gull (*Larus marinus*) *
- • Guillemot (*Uria aalge*)
- • Kittiwake (*Rissa tridactyla*) *
- • Leach's petrel (*Oceanodroma leucorhoa*)
- • Puffin (*Fratercula arctica*) *
- • Razorbill (*Alca torda*) *
- • Storm petrel (*Hydrobates pelagicus*)
- • Seabird assemblage
- *indicates assemblage qualifier only

Fair Isle SPA

- Arctic skua (*Stercorarius parasiticus*) *
- Arctic tern (*Sterna paradisaea*)
- Fair Isle wren (*Troglodytes troglodytes fridariensis*)
- Fulmar (*Fulmarus glacialis*) *
- Gannet (*Morus bassanus*) *
- Great skua (*Stercorarius skua*) *

- Guillemot (*Uria aalge*)
- Kittiwake (*Rissa tridactyla*) *
- Puffin (*Fratercula arctica*) *
- Razorbill (*Alca torda*) *
- Shag (*Phalocrocorax aristotelis*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Troup, Pennan and Lion's Heads SPA

- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*)
- Herring gull (*Larus argentatus*) *
- Kittiwake (*Rissa tridactyla*) *
- Razorbill (*Alca torda*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Foula SPA

- Arctic skua* (*Stercorarius parasiticus*)
- Arctic tern (*Sterna paradisaea*)
- Atlantic puffin (*Fratercula arctica*)
- Black-legged kittiwake* (*Rissa tridactyla*)
- Common guillemot (*Uria aalge*)
- European shag (*Phalacrocorax aristotelis*)
- Great skua (*Stercorarius skua*)
- Leach's storm petrel (*Oceanodroma leucorhoa*)
- Northern fulmar* (*Fulmarus glacialis*)
- Razorbill* (*Alca torda*)

[Redacted]

- Seabird assemblage, breeding
- *indicates assemblage qualifier only

Buchan Ness to Collieston Coast SPA

- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*) *
- Herring gull (*Larus argentatus*) *
- Kittiwake (*Rissa tridactyla*) *
- Shag (*Phalacrocorax aristotelis*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Sumburgh Head SPA

- Arctic tern (*Sterna paradisaea*)

- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*) *
- Kittiwake (*Rissa tridactyla*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Mousa SPA

- Arctic tern (*Sterna paradisaea*)
- Storm petrel (*Hydrobates pelagicus*)

Flannan Isles SPA

- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*) *
- Kittiwake (*Rissa tridactyla*) *
- Leach's petrel (*Oceanodroma leucorhoa*)
- Puffin (*Fratercula arctica*) *
- Razorbill (*Alca torda*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Noss SPA

- Fulmar (*Fulmarus glacialis*) *
- Gannet (*Morus bassanus*)
- Great skua (*Catharacta skua*)
- Guillemot (*Uria aalge*)
- Kittiwake (*Rissa tridactyla*) *
- Puffin (*Fratercula arctica*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Ramna Stacks and Gruney SPA

- Leach's petrel (*Oceanodroma leucorhoa*)

Fowlsheugh SPA

- Fulmar (*Fulmarus glacialis*) *
- Guillemot (*Uria aalge*)
- Herring gull (*Larus argentatus*) *
- Kittiwake (*Rissa tridactyla*)
- Razorbill (*Alca torda*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Canna and Sanday SPA

- Guillemot (*Uria aalge*) *
- Herring gull (*Larus argentatus*) *
- Kittiwake (*Rissa tridactyla*) *
- Puffin (*Fratercula arctica*) *
- Shag (*Phalacrocorax aristotelis*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Rum SPA

[Redacted]

- Common guillemot* (*Uria aalge*)
- Black-legged kittiwake* (*Rissa tridactyla*)
- Manx shearwater (*Puffinus puffinus*)

[Redacted]

- *indicates qualifying feature that is an assemblage feature only

Fetlar SPA

- Arctic skua (*Stercorarius parasiticus*) *
- Arctic tern (*Sterna paradisea*)
- Dunlin (*Calidris alpina schinzii*)
- Fulmar (*Fulmarus glacialis*) *
- Great skua (*Stercorarius skua*)

[Redacted]

[Redacted]

- Seabird assemblage
- *indicates assemblage qualifier only

Hermaness, Saxa Vord and Valla Field SPA

- Fulmar (*Fulmarus glacialis*) *
- Gannet (*Morus bassana*)
- Great skua (*Catharacta skua*)
- Guillemot (*Uria aalge*) *
- Kittiwake (*Rissa tridactyla*) *
- Puffin (*Fratercula arctica*)

[Redacted]

- Shag (*Phalacrocorax aristotelis*) *
- Seabird assemblage
- *indicates assemblage qualifier only

St. Kilda SPA

- Atlantic puffin (*Fratercula arctica*)
- Black-legged kittiwake* (*Rissa tridactyla*)
- Common guillemot* (*Uria aalge*)

- European storm petrel (*Hydrobates pelagicus*)
- Great skua (*Stercorarius skua*)
- Leach's storm petrel (*Oceanodroma leucorhoa*)
- Manx shearwater* (*Puffinus puffinus*)
- Northern fulmar* (*Fulmarus glacialis*)
- Northern gannet (*Morus bassanus*)
- Razorbill* (*Alca torda*)
- *indicates a qualifying feature that is an assemblage feature only.

Mingulay and Berberay SPA

- Fulmar (*Fulmaris glacialis*) *
- Guillemot (*Uria aalge*) *
- Kittiwake (*Rissa tridactyla*) *
- Puffin (*Fratercula arctica*) *
- Razorbill (*Alca torda*)
- Shag (*Phalocrocorax aristotelis*) *
- Seabird assemblage
- *indicates assemblage qualifier only

Forth Islands SPA

- Arctic tern (*Sterna paradisaea*)
- Common tern (*Sterna hirundo*)
- Cormorant (*Phalacrocorax carbo*) *
- Gannet (*Morus bassanus*)
- Guillemot (*Uria aalge*) *
- Herring gull (*Larus argentatus*) *
- Kittiwake (*Rissa tridactyla*) *
- Lesser black-backed gull (*Larus fuscus*)
- Puffin (*Fratercula arctica*)
- Razorbill (*Alca torda*) *

[Redacted]

- Sandwich tern (*Sterna sandvicensis*)
- Shag (*Phalacrocorax aristotelis*)
- Seabird assemblage
- *indicates assemblage qualifier only

Ailsa Craig SPA

- Gannet (*Morus bassanus*)
- Guillemot (*Uria aalge*) *
- Herring gull (*Larus argentatus*) *
- Kittiwake (*Rissa tridactyla*) *
- Lesser black-backed gull (*Larus fuscus*)

- Seabird assemblage
- *indicates assemblage qualifier only

Table 3 Conservation objectives

Faray and Holm of Faray SAC

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 features; and

To ensure for the qualifying species that the following are maintained in the long term:

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

Inner Hebrides and the Minches SAC

1) To ensure that the Inner Hebrides and the Minches SAC continues to make an appropriate contribution to harbour porpoise remaining at favourable conservation status.
2) To ensure for harbour porpoise within the context of environmental changes, that the integrity of the Inner Hebrides and the Minches SAC is maintained through 2a, 2b and 2c:
   - 2a) Harbour porpoise within the Inner Hebrides and the Minches are not at significant risk from injury or killing.
   - 2b) The distribution of harbour porpoise throughout the site is maintained by avoiding significant disturbance.
   - 2c) The condition of supporting habitats and the availability of prey for harbour porpoise are maintained.

Sanday SAC

To avoid deterioration of the qualifying habitats (listed below) 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 features; and

To ensure for the qualifying habitats that the following are maintained in the long term:

- Extent of the habitat on site
- Distribution of the habitat within site

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

Moray Firth SAC

1) To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2) To ensure that the integrity of Moray Firth SAC is maintained or restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

For subtidal sandbanks:

2a) Extent and distribution of the habitat within the site.
2b) Structure and function of the habitat and the supporting environment on which it relies.
2c) Distribution and viability of typical species of the habitat.

For bottlenose dolphin:

2a) The population of bottlenose dolphin is a viable component of the site.
2b) The distribution of bottlenose dolphin throughout the site is maintained by avoiding significant disturbance.
2c) The supporting habitats and processes relevant to bottlenose dolphin and the availability of prey for bottlenose dolphin are maintained.

River Thurso SAC

1) To ensure that the qualifying feature of the River Thurso SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Thurso SAC is restored by meeting objectives 2a, 2b and 2c for Atlantic salmon:
    a. Restore the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
    b. Restore the distribution of Atlantic salmon throughout the site.
    c. Restore the habitats supporting Atlantic salmon within the site and availability of food.

River Naver SAC

1) To ensure that the qualifying features of the River Naver SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.

2) To ensure that the integrity of the River Naver SAC is restored by meeting objectives 2a, 2b, 2c for both features (and 2d for freshwater pearl mussel):

Freshwater pearl mussel:

a. Restore the population of freshwater pearl mussel as a viable component of the site.
b. Restore the distribution of freshwater pearl mussel throughout the site.
c. Restore the habitats supporting the freshwater pearl mussel within the site and availability of food.
d. Maintain the distribution and viability of freshwater pearl mussel host species and their supporting habitats.

Atlantic salmon

a. Maintain the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
b. Maintain the distribution of Atlantic salmon throughout the site.
c. Maintain the habitats supporting Atlantic salmon within the site and availability of food.

River Borgie SAC

1) To ensure that the qualifying features of the River Borgie SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Borgie SAC is restored by meeting objectives 2a, 2b, 2c for each qualifying feature (and 2d for freshwater pearl mussel):

Freshwater pearl mussel

a. Restore the population of freshwater pearl mussel as a viable component of the site.
b. Restore the distribution of freshwater pearl mussel throughout the site.
c. Restore the habitats supporting freshwater pearl mussel within the site and availability of food.
d. Maintain the distribution and viability of freshwater pearl mussel host species and their supporting habitats.

Atlantic salmon

a. Maintain the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
b. Maintain the distribution of Atlantic salmon throughout the site.

c. Maintain the habitats supporting Atlantic salmon within the site and availability of food.

[Redacted]

Berriedale and Langwell Waters SAC

1) To ensure that the qualifying feature of the Berriedale and Langwell Waters SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the Berriedale and Langwell Waters SAC is maintained by meeting objectives 2a, 2b and 2c for Atlantic salmon:
    a. Maintain the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
    b. Maintain the distribution of the species throughout the site.
    c. Maintain the habitats supporting the species within the site and availability of food.

River Spey SAC

1) To ensure that the qualifying features of the River Borgie SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Borgie SAC is restored by meeting objectives 2a, 2b, 2c for each qualifying feature (and 2d for freshwater pearl mussel):

Freshwater pearl mussel

a. Restore the population of freshwater pearl mussel as a viable component of the site.
b. Restore the distribution of freshwater pearl mussel throughout the site.
c. Restore the habitats supporting freshwater pearl mussel within the site and availability of food.
d. Maintain the distribution and viability of freshwater pearl mussel host species and their supporting habitats.

Sea lamprey

a. Maintain the population of sea lamprey as a viable component of the site.
b. Maintain the distribution of sea lamprey throughout the site.

c. Maintain the habitats supporting sea lamprey within the site and availability of food.

Atlantic salmon

a. Restore the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
b. Restore the distribution of Atlantic salmon throughout the site.
c. Restore the habitats supporting Atlantic salmon within the site and availability of food.

[Redacted]

Little Gruinard River SAC

1) To ensure that the qualifying feature of Little Gruinard River SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the Little Gruinard River SAC is maintained by meeting objectives 2a, 2b and 2c for Atlantic salmon:
    a. Maintain the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
    b. Maintain the distribution of Atlantic salmon throughout the site.
    c. Maintain the habitats supporting Atlantic salmon within the site and availability of food.

River Oykel SAC

1) To ensure that the qualifying features of the River Oykel SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Oykel SAC is restored by meeting objectives 2a, 2b, 2c for both features (and 2d for freshwater pearl mussel):

Freshwater pearl mussel:

a. Restore the population of freshwater pearl mussel as a viable component of the site.
b. Restore the distribution of freshwater pearl mussel throughout the site.
c. Restore the habitats supporting the freshwater pearl mussel within the site and availability of food.

d. Maintain the distribution and viability of freshwater pearl mussel host species and their supporting habitats.

Atlantic salmon

a. Maintain the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
b. Maintain the distribution of Atlantic salmon throughout the site.
c. Maintain the habitats supporting Atlantic salmon within the site and availability of food.

Langavat SAC

1) To ensure that the qualifying feature of Langavat SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of Langavat SAC is restored by meeting objectives 2a, 2b and 2c for the qualifying feature:
    a. Restore the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
    b. Restore the distribution of Atlantic salmon throughout the site.
    c. Restore the habitats supporting Atlantic salmon within the site and availability of food.

North Harris SAC

To avoid deterioration of the qualifying habitats (listed below) 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 features; and

To ensure for the qualifying habitats that the following are maintained in the long term:

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

River Dee SAC

1) To ensure that the qualifying features of the River Dee SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Dee SAC is restored by meeting objectives 2a, 2b, 2c for each qualifying feature (and 2d for freshwater pearl mussel):

Freshwater pearl mussel

a. Restore the population of freshwater pearl mussel as a viable component of the site.
b. Restore the distribution of freshwater pearl mussel throughout the site.
c. Restore the habitats supporting freshwater pearl mussel within the site and availability of food.
d. Maintain the distribution and viability of freshwater pearl mussel host species and their supporting habitats.

Atlantic salmon

a. Maintain the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
b. Maintain the distribution of Atlantic salmon throughout the site.
c. Maintain the habitats supporting Atlantic salmon within the site and availability of food.

[Redacted]

River Moriston SAC

1) To ensure that the qualifying features of the River Moriston SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Moriston SAC is restored by meeting objectives 2a, 2b, 2c for both features (and 2d for freshwater pearl mussel):

Freshwater pearl mussel:

a. Restore the population of freshwater pearl mussel as a viable component of the site.
b. Restore the distribution of freshwater pearl mussel throughout the site.
c. Restore the habitats supporting the freshwater pearl mussel within the site and availability of food.
d. Restore the distribution and viability of freshwater pearl mussel host species and their supporting habitats.

Atlantic salmon

a. Restore the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
b. Restore the distribution of Atlantic salmon throughout the site.
c. Restore the habitats supporting Atlantic salmon within the site and availability of food.

River South Esk SAC

1) To ensure that the qualifying features of the River South Esk SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River South Esk SAC is restored by meeting objectives 2a, 2b, 2c for both features (and 2d for freshwater pearl mussel):

Freshwater pearl mussel:

a. Restore the population of freshwater pearl mussel as a viable component of the site.
b. Restore the distribution of freshwater pearl mussel throughout the site.
c. Restore the habitats supporting the freshwater pearl mussel within the site and availability of food.
d. Restore the distribution and viability of freshwater pearl mussel host species and their supporting habitats.

Atlantic salmon

a. Restore the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
b. Restore the distribution of Atlantic salmon throughout the site.
c. Restore the habitats supporting Atlantic salmon within the site and availability of food.

River Tay SAC

Conservation Objectives for clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels (Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*):

1) To ensure that the qualifying feature of the River Tay SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Tay is maintained by meeting objectives 2a, 2b and 2c for the qualifying feature.
    a. Maintain the extent and distribution of clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels within the site.

b. Maintain the structure, function and supporting processes of clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels.
c. Maintain the distribution and viability of typical species of clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels.

Conservation Objectives for all species features:

1) To ensure that the qualifying features of River Tay SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Tay is maintained by meeting objectives 2a, 2b and 2c for each qualifying feature.

Sea lamprey, Brook lamprey and river lamprey:

a. Maintain the population of the lamprey species' as viable components of the site.
b. Maintain the distribution of the lamprey species throughout the site.
c. Maintain the habitats supporting the lamprey species within the site, and availability of food.

Atlantic salmon:

a. Maintain the population of Atlantic salmon, including range of genetic types, as a viable component of the site.
b. Maintain the distribution of Atlantic salmon throughout the site.
c. Maintain the habitats supporting Atlantic salmon within the site and availability of food.

[Redacted]

River Tweed SAC

Conservation Objectives for rivers with floating vegetation often dominated by water-crowfoot (water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation):

1) To ensure that the qualifying feature of the River Tweed SAC is in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Tweed SAC is restored by meeting objectives 2a, 2b and 2c for the qualifying feature:

a. To ensure that the integrity of the River Tweed SAC is restored by meeting objectives 2a, 2b and 2c for the qualifying feature.
b. Restore the structure, function and supporting processes of the habitat.
c. Restore, the distribution and viability of typical species of the habitat.

Overarching Conservation Objectives for all species:

1) To ensure that the qualifying features of the River Tweed SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Tweed SAC is restored by meeting objectives 2a, 2b and 2c for each qualifying feature.

Sea lamprey:

a. Restore the population of the species as a viable component of the site.
b. Restore the distribution of the species throughout the site.
c. Restore the habitats supporting the species within the site and availability of food.

Brook lamprey and River lamprey:

a. Maintain the population of lamprey species as a viable component of the site.
b. Maintain the distribution of lamprey species throughout the site.
c. Maintain the habitats supporting lamprey species within the site and availability of food.

Atlantic salmon:

a. Maintain the population of the species, including range of genetic types, as a viable component of the site.
b. Maintain the distribution of the species throughout the site.
c. Maintain the habitats supporting the species within the site and availability of food.

[Redacted]

River Teith SAC

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 features; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the 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.

Endrick Water SAC

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 features; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the 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.

River Bladnoch SAC

1) To ensure that the qualifying feature of the River Bladnoch SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
2) To ensure that the integrity of the River Bladnoch SAC is restored by meeting objectives 2a, 2b and 2c for the qualifying feature:
    a. Restore the population of the species, including range of genetic types, as a viable component of the site.
    b. Restore the distribution of the species throughout the site.
    c. Restore the habitats supporting the species within the site and availability of food.

North Caithness Cliffs SPA, Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest

Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, Mingulay and Berberay SPA, Forth Islands SPA and Ailsa Craig SPA

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

To ensure for the qualifying species that the following are maintained in the long term:

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

Foula SPA (draft conservation objectives)
To ensure that the qualifying features of Foula SPA and the Seas off Foula SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.

To ensure that the integrity of Foula SPA and the Seas off Foula SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

2a. The populations of the qualifying features are viable components of Foula SPA and Seas off Foula SPA.
2b. The distributions of the qualifying features throughout Foula SPA and Seas off Foula SPA are maintained by avoiding significant disturbance of the species.
2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate restored, at Foula SPA and Seas off Foula SPA.

Rum SPA (draft conservation objectives)

1. To ensure that the qualifying features of Rum SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of Rum SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:
   2a. The populations of the qualifying features are viable components of Rum SPA.

2b. The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species.
2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate, restored at Rum SPA.

St. Kilda SPA (draft conservation objectives)
1. To ensure that the qualifying features of St Kilda SPA and the Seas off St Kilda SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.

2. To ensure that the integrity of St Kilda SPA and the Seas off St Kilda SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

2a. The populations of qualifying features are viable components of St Kilda SPA and Seas off St Kilda SPA.
2b. The distributions of the qualifying features throughout St Kilda SPA and Seas off St Kilda SPA are maintained by avoiding significant disturbance of the species.
2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate restored, at St Kilda SPA and/or Seas off St Kilda SPA.

SECTION 3: ASSESSMENT IN RELATION TO REGULATION 48 OF THE CONSERVATION (NATURAL HABITATS, &C.) REGULATIONS 1994 AND REGULATION 63 OF THE CONSERVATION OF HABITATS AND SPECIES REGULATIONS 2017

7 Requirement for appropriate assessment

7.1 Is the project directly connected with or necessary to the conservation management of the site(s)?

7.1.1 The project is not directly connected with or necessary to the conservation management of the site.

7.2 *Is the project likely to have a significant effect on the qualifying interest(s)?*

7.2.1 NatureScot in its response dated 13 October 2022, advised that the proposal is likely to have a significant effect on the following qualifying interests of the following SACs;

Faray and Holm of Faray SAC

- Grey seal

Inner Hebrides and the Minches SAC

- Harbour porpoise

Sanday SAC

- Harbour seal

Moray Firth SAC

- Bottlenose dolphin

River Thurso SAC, Berriedale and Langwell Waters SAC, Little Gruinard River SAC, Langavat SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC and River Bladnoch SAC

- Atlantic salmon

River Naver SAC, River Borgie SAC, River Spey SAC, River Oykel SAC, North Harris SAC, River Dee SAC, River Moriston SAC and River South Esk SAC

- Atlantic salmon
- Freshwater pearl mussel

7.2.2 NatureScot advised that the marine mammal qualifying interests of the Faray and Holm of Faray, Inner Hebrides and the Minches, Sanday and Moray Firth SACs are at risk of disturbance through underwater noise generated during construction and decommissioning and entanglement during the operational phase of the HWL proposal.

7.2.3 NatureScot advised that the Atlantic salmon and freshwater pearl mussel qualifying interests of the River Thurso, Berriedale and Langwell Waters, Little Gruinard River, Langavat, River Tay, River Tweed, River Teith, Endrick Water, River Bladnoch, River Naver, River Borgie, River Spey, River Oykel, North Harris, River Dee, River Moriston and River South Esk SACs have potential to be at risk of disturbance as a result of disturbance to, and possible alteration of migration routes, caused by underwater noise generated during construction activities as well as EMFs potentially affecting migration during operation of the HWL proposal. These effects would be direct in the case of Atlantic salmon and indirect in the case of freshwater pearl mussel as the former species plays an integral role in the life-cycle of the latter.

7.2.4 NatureScot in its response dated 24 February 2023 advised the proposal is likely to have a significant effect due to risk of displacement and collision as a result of the HWL proposal on the following qualifying interests of the following SPAs:

North Caithness Cliffs SPA

- Fulmar (breeding)
- Guillemot (breeding)

- Kittiwake (breeding)
- Puffin (breeding)
- Razorbill (breeding)

[Redacted]

Caithness and Sutherland Peatlands SPA

[Redacted]

Hoy SPA

- Fulmar (breeding)
- Great skua (breeding)
- Guillemot (breeding)
- Kittiwake (breeding)
- Puffin (breeding)

[Redacted]

Cape Wrath SPA

- Fulmar (breeding)
- Guillemot (breeding)
- Kittiwake (breeding)
- Puffin (breeding)
- Razorbill (breeding)

Sule Skerry and Sule Stack SPA

- Gannet (breeding)
- Guillemot (breeding)
- Leach’s petrel (breeding)
- Puffin (breeding)
- Storm petrel (breeding)

Marwick Head SPA

- Guillemot (breeding)
- Kittiwake (breeding)

East Caithness Cliffs SPA

- Fulmar (breeding)
- Guillemot (breeding)
- Herring gull (breeding)
- Kittiwake (breeding)
- Razorbill (breeding)

Copinsay SPA, Rousay SPA, Calf of Eday SPA

- Fulmar (breeding)
- Guillemot (breeding)

- Kittiwake (breeding)

West Westray SPA
- Fulmar (breeding)
- Guillemot (breeding)
- Kittiwake (breeding)
- Razorbill (breeding)

Auskerry SPA, Priest Island SPA and Mousa SPA
- Storm petrel (breeding)

Handa SPA
- Fulmar (breeding)
- Great skua (breeding)
- Guillemot (breeding)
- Kittiwake (breeding)
- Razorbill (breeding)

North Rona and Sula Sgeir SPA
- Fulmar (breeding)
- Gannet (breeding)
- Kittiwake (breeding)
- Leach’s petrel (breeding)
- Puffin (breeding)
- Razorbill (breeding)
- Storm petrel (breeding)

Fair Isle SPA
- Fulmar (breeding)
- Gannet (breeding)
- Great skua (breeding)
- Kittiwake (breeding)
- Puffin (breeding)

Troup, Pennan and Lion’s Heads SPA
- Fulmar (breeding)
- Gannet (breeding)
- Kittiwake (breeding)

Foula SPA
- Fulmar (breeding)
- Great skua (breeding)
- Kittiwake (breeding)
- Leach’s petrel (breeding)

- Puffin (breeding)

Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA and Fowlsheugh SPA

- Fulmar (breeding)
- Kittiwake (breeding)

Flannan Isles SPA

- Fulmar (breeding)
- Kittiwake (breeding)
- Leach's petrel (breeding)
- Puffin (breeding)

Noss SPA

- Fulmar (breeding)
- Gannet (breeding)
- Great skua (breeding)
- Kittiwake (breeding)
- Puffin (breeding)

Ramna Stacks and Gruney SPA

- Leach's petrel (breeding)

Canna and Sanday SPA

- Kittiwake (breeding)

Rum SPA

- Manx shearwater (breeding)

Fetlar SPA

- Fulmar (breeding)
- Great skua (breeding)

Hermaness, Saxa Vord and Valla Field SPA

- Fulmar (breeding)
- Gannet (breeding)
- Great skua (breeding)

St. Kilda SPA

- Fulmar (breeding)
- Gannet (breeding)
- Great skua (breeding)
- Leach's petrel (breeding)
- Manx shearwater (breeding)
- Storm petrel (breeding)

Mingulay and Berberay SPA and Forth Islands SPA

- Fulmar (breeding)

Ailsa Craig SPA

- Gannet (breeding)

MD-LOT agrees with the NatureScot advice and has undertaken an AA for the above qualifying features of the Faray and Holm of Faray SAC, Inner Hebrides and the Minches SAC, Sanday SAC, Moray Firth SAC, River Thurso SAC, River Naver SAC, River Borgie SAC, Berriedale and Langwell Waters SAC, River Spey SAC, Little Gruinard River SAC, River Oykel SAC, Langavat SAC, North Harris SAC, River Dee SAC, River Moriston SAC, River South Esk SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC, River Bladnoch SAC, North Caithness Cliffs SPA, Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA and Ailsa Craig SPA.

8 Appropriate assessment of the implications for the site in view of the site's conservation objectives.

8.1 North Caithness Cliffs SPA, Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA and Ailsa Craig SPA.

8.1.1 NatureScot in its advice dated 13 October 2022, noted that further information on puffin and kittiwake displacement and collision risk would be required to ascertain effects on site integrity. In addition, further information was required for collision risk modelling assessments relating to great black backed gull and herring gull. RSPB Scotland also required further information relating to PVA in its correspondence dated 5 October 2022.

8.1.2 Consequent to the above, NatureScot concluded that there will be adverse effect on site integrity, from the HWL proposal alone or in combination with other projects, on Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA and Ailsa Craig SPA.

8.2 North Caithness Cliffs SPA – puffin and kittiwake

8.2.1 Both NatureScot and RSPB Scotland raised particular concern in relation to the kittiwake and puffin qualifying features of the North Caithness Cliffs SPA. Therefore this SPA is considered in more detail in this AA.

8.2.2 The HWL Report to Inform the AA (RIAA, Habitat Regulation Assessment Report Redacted) and Offshore Environmental Impact Assessment ("EIA") Report, Chapter 12: Marine Ornithology (Chapter 12. Marine Ornithology) and associated technical appendices (Environmental Impact Assessment Report - Pentland Floating Offshore Wind Farm) provide a full explanation of the methods used by HWL to assess potential impacts from the HWL proposal on SPA qualifying features.

8.2.3 The marine ornithology assessment within the RIAA firstly estimated the predicted levels of effect (collision and/or displacement and barrier effects, depending on the species) informed by the baseline numbers of birds estimated to occur in the HWL proposal array area. Secondly, the numbers of individuals that were predicted to be affected were apportioned to SPA and non-SPA breeding colonies. Lastly, where advised through the scoping opinion and subsequent consultation responses and discussion, the population level consequences of these effects were estimated using a Population Viability Analysis ("PVA") population model.

8.2.4 HWL provided additional information in October 2022 at the request of MD-LOT. Additional information was asked to address the concerns raised by NatureScot and RSPB Scotland in relation to some of the assessment methods used by HWL. The additional information was subsequently used by NatureScot and RSPB Scotland to inform the consultation responses. Finally, NatureScot commissioned United Kingdom Centre for Ecology and Hydrology ("UKCEH") to run the Cumulative Effects Framework ("CEF") to assess potential impacts of the HWL proposal in combination with the Moray Firth offshore wind farms, on the puffin qualifying feature of North Caithness Cliffs SPA.

8.3 Regulatory, statutory and non-statutory advice to inform the appropriate assessment.

8.3.1 NatureScot, in its scoping advice dated 18 February 2021, advised that barrier/displacement effects for auks during both the breeding and non-breeding seasons are assessed using the SNCB (2017) matrix methods (Appendix 12.6. Marine Ornithology Consultation Advice). NatureScot also supported the use of the SeaBORD tool for assessing barrier/displacement during the breeding season for species with tracking data.

8.3.2 Additionally, NatureScot in response to Appendix 12.6. Marine Ornithology Consultation Advice advised that for kittiwake, collision and displacement were previously considered to be mutually exclusive impacts, but that that further discussion and agreement on impact pathways and assessment methods in consultation with Marine Scotland was required for this species (Appendix 12.6. Marine Ornithology Consultation Advice).

8.3.3 Furthermore, NatureScot advised the use of the basic and extended Band (2012) models for Collision Risk Modelling, primarily with option 2 and 3 for the worst case and most likely scenario. NatureScot also supported the use of the stochastic Collision Risk Model (Masden 2015). NatureScot advised that flight speeds should reply on published data and avoidance rates based on SNCB (2014) guidance.

8.3.4 The Scottish Ministers, in the Scoping Opinion issued on 28 September 2021, advised the use of a 2km buffer around the HWL proposal array area, recognising that birds can be displaced from both within the array area and from an area (buffer) surrounding the array area. Despite this, HWL used a buffer of 0.5km in the SeabORD tool, justifying this approach by the small size of the HWL proposal array area (10km^2) and noting that use of a 2km buffer makes the area of displacement impacts almost four times larger than the wind farm area alone. Impacts from the displacement matrix approach were estimated with and without a 2km buffer.

8.3.5 In line with the NatureScot, MSS and RSPB Scotland recommendations in the Scoping Opinion, HWL used the Natural England PVA tool (Searle et al., 2019) to undertake PVA modelling. PVA models population changes assuming particular rates of productivity and survival and can be used to compare forecast changes in bird populations in the presence of offshore wind farm-induced mortality ('impacted') with those in the absence of offshore wind farm mortality ('unimpacted'). The population estimated at the end of the wind farm operational period is compared with the estimated population after the same period, but in the absence of any wind farm effects. This comparison is made using the ratio of impacted to unimpacted population sizes ("CPS"), and the ratio of the impacted to unimpacted growth rates ("CGR"). A value of 1 would indicate no difference, whilst a value of 0.5 would indicate a halving of population size or growth rate, as a result of wind farm effects. Population growth rate ("PGR") can also be presented as "annualised" growth rate ("AGR"), which is standardised since the baseline ("unimpacted") reference year. PVA outputs presented in Appendix 12.5. Marine Ornithology Population Modelling used the PVA to forecast the populations over 30 years of offshore wind farm impacts (2027-2057) as this was the intended operational period for

the HWL proposal. However, NatureScot requested (advice dated 21 October 2022) that impacts be modelled over a 25 year period to allow comparison with other offshore windfarms with a 25 year operational period. The Addendum of Additional Information provided population modelling outputs for a 25 year of impact (2027-2052). PVA was run for an initial 10 years (2016-2026) with no offshore wind farm impacts, followed by 25 years of offshore wind farm impacts (2027-2052).

8.4 Baseline kittiwake abundance and distribution

8.4.1 Within the HWL proposal array area, the peak kittiwake population estimate was recorded in June of both survey years, with 50 and 134 birds in 2015 and 2021, respectively. When including the array area 2km buffer, these values increased to 285 (2015) and 808 (2021) birds. May, June and July had the highest breeding season abundances in both the array area alone and the array area plus 2km buffer. The peak non-breeding population estimate was recorded in November 2015, with 39 birds observed within the array area, increasing to 214 birds when including the 2km buffer. However, non-breeding abundances were generally much lower than breeding in both survey years.

8.5 Apportioning of kittiwake

8.5.1 The citation population for kittiwake at North Caithness Cliffs SPA is 13,100 pairs but the population has undergone a decline since designation, with a most recent count of 5,573 pairs.

8.5.2 The HWL proposal is 7.5km away from the North Caithness Cliffs SPA. Published foraging ranges for kittiwake (mean maximum foraging range = 156.1km, Woodward et al. 2019) suggest that breeding individuals from this SPA could occur within the array area as well as the Moray Firth offshore wind farms. During the non-breeding season, kittiwake from North Caithness Cliffs SPA could encounter offshore wind farms across the North Sea, based on information presented in the kittiwake Biologically Defined Minimum Population Scales (BDMPS, Furness et al. 2015).

8.5.3 Using the Marine Scotland Apportioning Tool method advised by MSS and NatureScot an apportioning weighting of 0.717 was derived for North Caithness Cliffs SPA during the breeding season. This indicates that during the breeding season, it should be assumed that 71.7% or the kittiwake occurring in HWL array area, and any associated buffer area originate from the North Caithness Cliffs SPA.

8.6 Kittiwake Mortality from HWL proposal in isolation

Collision impacts

8.6.1 An avoidance rate for kittiwake of 0.989 was used by HWL to estimate collision mortalities. However, more recently, NatureScot have updated its guidance to recommend a higher avoidance rate for kittiwake of 0.993 (NatureScot, 2023) which would result in a 35% reduction in estimated collision mortality. This

guidance was issued in February 2023, after HWL submitted its application and Addendum of Additional Information.

Displacement and barrier effects

8.6.2 Both SeabORD and the displacement matrix approach were used to assess displacement and barrier effects from the HWL proposal, assuming a displacement rate of 30% for kittiwake. For the matrix approach, a mortality rate of 1%, 2% and 3% for displaced birds were presented by HWL.

Breeding season predicted kittiwake mortalities

8.6.3 Kittiwake mortality from the HWL proposal in isolation apportioned to North Caithness Cliffs SPA are presented in **Table** 4. NatureScot advised use of SeabORD in preference to the matrix approach, due to SeabORD's greater biological realism. Consequently, kittiwake displacement and collision mortality at North Caithness Cliffs SPA during the breeding season, from HWL proposal in isolation, was predicted to be between 7 and 11 kittiwake per annum. MD-LOT notes that adding displacement and collision may overestimate effects as displaced birds cannot collide with WTGs at that development.

Table 4 Breeding season kittiwake collision and displacement mortality (number of birds per annum) for the HWL proposal in isolation, apportioned to the North Caithness Cliffs SPA (Collision mortalities taken from Appendix 12.3. Marine Ornithology Collision Risk Modelling Section 4, Table 1, p12. Displacement mortalities taken from Appendix 12.4. Marine Ornithology Displacement Analysis Annex B, Section B1: Kittiwake, Table B1.1 p28 (note SPA total displacement mortalities were derived by summing values for each of the five SPA subsections presented in Table B1.1)

Impact pathway	Modelling approach	Buffer	Numbers of birds[1]
Collision	Mean kittiwake density	n/a	5.02
	Maximum kittiwake density	n/a	8.60
Displacement	SeabORD (moderate environmental conditions)[1]	0.5 km	2.6
	SeabORD (good environmental conditions) [1]	0.5 km	2.0

[1] Rescaled mortalities presented in the Addendum of Additional Information

Non-breeding season predicted kittiwake mortalities

8.6.4 As represented in Appendix 12.1. Marine Ornithology Baseline Data, mean non-breeding seasonal peak abundances for all kittiwake seen within the HWL proposal area were 118 (CI 47-200) birds for Autumn Migration and 41 (CI 16-67) birds for Spring Migration. In the non-breeding season, the estimated kittiwake collision mortalities were 1 bird (mean densities) and 3 birds (max densities) for autumn migration and zero birds for spring migration. When apportioned using BDMPS (Furness 2015) this gives further collision mortalities of 0.02 birds (mean densities) and 0.07 birds (maximum densities) to assign against the North Caithness Cliffs SPA. This is in addition to the

breeding season impacts noted in Appendix 12.3. Marine Ornithology Collision Risk Modelling paragraphs 37-38, p12.

Assessing kittiwake population response in isolation

8.6.5 By comparing impacted and unimpacted population sizes (CPS) and growth rates (CGR), it is possible to assess how the kittiwake population might respond to the HWL proposal impacts during 25 years of operation. Impacts from the HWL proposal over 25 years of operation resulted in a predicted reduction in population size to 98% (a CPS value of 0.98) of what population size would be without HWL proposal impacts, as seen in Table 6.

8.6.6 NatureScot concluded that the HWL proposal in isolation would not have an adverse effect on kittiwake features at North Caithness Cliffs SPA. RSPB raised concerns about the lack of non-breeding season assessment for kittiwake and, whilst noting predicted impacts were small, maintained its objection to the HWL proposal in isolation.

8.7 *Kittiwake mortality from HWL proposal in combination*

8.7.1 To assess in combination impacts on the population of the kittiwake qualifying feature of the North Caithness Cliffs SPA, it was necessary to incorporate estimated collision and displacement effects from Moray Firth offshore wind farms (for the breeding and non-breeding season) and from other UK offshore wind farms in the North Sea (non-breeding season). Mortality estimates from the Moray Firth and North Sea offshore wind farms are provided in Table 5.

8.7.2 Information on the potential effects of the three Moray Firth offshore wind farms (Beatrice, Moray East and Moray West) was obtained from the Moray West Offshore EIA Report and EIA Addendum. However, for collision, kittiwake mortality estimates, which were higher and more recent, were taken from Hornsea project four Environmental Statement (Orsted, 2021). Kittiwake displacement mortalities in the Moray West reports were estimated using the displacement matrix (30% displacement, 2% mortality) and collision mortalities were estimated using the Collision Risk Model (amended and collated in order to be most representative of Band Option 1; Orsted, 2021) and mean kittiwake densities, as represented in Appendix 12.5. Marine Ornithology Population Modelling.

8.7.3 North Sea collision effects were taken from the Hornsea Project Four Environmental Statement from 2021. This summarises all the estimated non-breeding season kittiwake collision mortalities arising from consented, constructed and proposed UK offshore wind farms in the North Sea BDMPS geographic area, excluding the HWL proposal and Moray Firth offshore wind farm projects. Table A.1.3.1, Page 21 of the HWL proposal Volume 3: Appendix 12.5. Marine Ornithology Population Modelling lists all the offshore wind farm projects included in the North Sea BDMPS area by Hornsea Project Four. The non-breeding season collision mortality total includes collision estimates produced using an avoidance rate of 98.9% as advised by NatureScot in the scoping advice. This is lower than the interim rate of 99.2% in the recently published NatureScot guidance. The increase of avoidance rate from 98.9%

to 99.2% included in the NatureScot guidance in January 2023 would result in a reduction in estimated collisions of approximately 25%. Many of the North Sea projects included within the cumulative assessment applied avoidance rates lower than 98.9%. The estimate of 65.02 Kittiwake collision mortalities during the non-breeding season from North Sea offshore wind farms that has been used in the assessment is therefore highly precautionary.

Table 5. Kittiwake breeding and non-breeding season collision and displacement mortalities (number of birds per annum) from the HWL proposal in combination with Moray Firth and North Sea offshore wind farms apportioned to North Caithness Cliffs SPA.

Offshore Wind Farms	Breeding season		Non-breeding season	
	Collision	Displacement	Collision	Displacement
HWL proposal	5.02[1]	2.60[2]	0.02[1]	n/a [3]
Moray Firth offshore wind farms	4.65[8]	2.13[6]	2.70[9]	'Effectively zero' [7]
North Sea offshore wind farms	0[5]	0[5]	65.02[10]	n/a [4]

[1] Collision mortality estimates assumed mean densities (estimates taken from Appendix 12.3. Marine Ornithology Collision Risk Modelling Section 4, Table 11, p12 for breeding season and paragraphs 37-38, p12, for non-breeding season). Of these 5.02 birds, 4.77 were adults and 0.25 immatures (Appendix 12.5. Marine Ornithology Population Modelling Annex A, Section A.1.1, p18, Kittiwake Scenario 1. All of the 0.02 non-breeding season mortalities were adults. [2] Displacement mortality estimates assumed 'moderate' environmental conditions (estimates taken from Appendix 12.4. Marine Ornithology Displacement Analysis Annex B, Section B1: Kittiwake, Table B1.1 p28 (note SPA total displacement mortalities were derived by summing values for each of the five SPA subsections presented in Table B1.1). [3] Non-breeding season displacement kittiwake mortality was assumed to be zero: Appendix 12.4. Marine Ornithology Displacement Analysis p16 Paragraph 56. Breeding season estimated mortality was 2.6, total breeding season and non-breeding season mortalities combined was also 2.6 birds.[4] Non-breeding season displacement mortality from North Sea offshore wind farms were not assessed or presented in any reports. Only collision mortalities were used to assess in combination North Sea offshore wind farm effects. [5] During the breeding season, kittiwakes from the North Caithness Cliffs SPA will not be within foraging range of any of the North Sea offshore wind farms and so displacement and collision effects from these offshore wind farms are zero.[6] Value taken from Appendix 12.5. Marine Ornithology Population Modelling Annex A, Section A1.2, p19, Table A1.2.1. [7] Moray Firth kittiwake displacement mortality estimates were so low in the non-breeding season that effectively zero birds were apportioned against North Caithness Cliffs SPA Appendix 12.5. Marine Ornithology Population Modelling Appendix A, Section A1.2, paragraph 15, p19. [8] Value taken from Appendix 12.5. Marine Ornithology Population Modelling Appendix A, Section A1.2, Table A.1.2.2. Of the 4.65 mortalities, 4.42 were adults and 0.23 immatures.[9] Value taken from Appendix

12.5. Marine Ornithology Population Modelling Appendix A, Section A1.2, Table A.1.2.23. Spring and autumn migration BDMPS season mortality estimates were summed to derive a non-breeding season mortality estimate. Of the 2.70 mortalities, 1.49 were adults and 1.21 were immatures.[10] Value taken from Appendix 12.5. Marine Ornithology Population Modelling Appendix A, Section A1.3, Table A.1.3.1. Spring and autumn migration BDMPS season mortality estimates were summed to derive a non-breeding season mortality estimate. Of the 65.02 mortalities, 35.76 were adults and 29.26 were immatures.

Assessing kittiwake population response in combination

8.7.4 The forecast response of the population of the kittiwake qualifying feature of the North Caithness Cliffs SPA to the estimated collision and displacement impacts of the HWL proposal in combination with the Moray Firth and North Sea offshore wind farms was assessed in three scenarios, as seen in Table 6. The two HWL in isolation scenarios from the previous section are also provided here to enable comparison of population response to impacts from the HWL proposal in isolation and HWL proposal in combination.

Table 6. Response of the kittiwake North Caithness Cliffs SPA population to collision and displacement mortality from the HWL proposal in isolation and in combination with Moray Firth offshore wind farms and North Sea offshore wind farms, over a 25 year period of offshore wind farms operation (2027-2052). CGR: counterfactual of growth rate; CPS: counterfactual of population size (from Addendum of Additional Information; Annex C; Table 4).

Scenario	Season	Population size (adult individuals; year: 2052)	CGR	CPS
0. Baseline (no offshore wind farms)		4,205		
1. HWL proposal in isolation (mean density CRM)	breeding	4,125	0.999	0.981
2. HWL proposal in isolation (max density CRM)	breeding	4,087	0.999	0.975
3. HWL proposal + Moray Firth offshore wind farms	breeding	4,027	0.998	0.960
4. North Sea offshore wind farms only (excluding HWL proposal)	non-breeding	3,655	0.995	0.873
5. HWL proposal + Moray Firth offshore wind farms (breeding season) and North Sea offshore wind farms (non-breeding season)	year-round	3,534	0.993	0.840

8.7.5 The HWL proposal in combination with both the Moray Firth offshore wind farms and North Sea offshore wind farms (Scenario 5) are predicted to result in the population of the kittiwake qualifying feature of the North Caithness Cliffs SPA to be 84% (CPS value of 0.84) of the unimpacted population size after 25 years. NatureScot describes this as being ‘of concern’ but noted that there is uncertainty in these results due to the assumption that the list of projects

included in this scenario will all be consented and built out - noting that between consent and build out there can be design iterations reducing the realistic worst-case scenarios.

8.7.6 The approach used in the HWL proposal EIAR combines SeabORD approaches (for the HWL proposal) with displacement matrix approaches (for Moray Firth OWFs). RSPB expressed concerns about this and so used predicted impacts from the displacement matrix only for both the HWL proposal and Moray Firth OWFs to inform its response. However, RSPB cautioned that the lack of buffer and use of the matrix approach (which has less biological realism compared to the SeabORD model) meant these outputs did not represent best available assessment of impacts.

8.7.7 NatureScot advised that the HWL proposal in-combination with North Sea OWFs could have an adverse impact on kittiwake qualifying features at North Caithness Cliffs SPA, and the RSPB maintained its objection to the HWL proposal in-combination with North Sea OWFs.

8.8 Kittiwake - conclusion for 25 or 30 year operational period

8.8.1 In reaching its conclusion, the MD-LOT has considered the conservation objectives, the populations at the sites, the predicted levels of impact and population consequences, the precaution in the assessment methods and the consultation responses from NatureScot and RSPB Scotland. MD-LOT conclude that, there will be no adverse effect on the site integrity of the North Caithness Cliffs SPA in respect of the kittiwake qualifying interest as a result of the HWL proposal in isolation. However, MD-LOT conclude that there could be an adverse effect on the site integrity of the North Caithness Cliffs SPA in respect of the kittiwake qualifying interest as a result of the HWL proposal in combination with the Moray Firth and other North Sea offshore wind farms for an operational period of 25 or 30 years.

8.9 Baseline puffin abundance and distribution

8.9.1 Within the HWL proposal array area, June represented the peak puffin population estimate in both years of survey, 419 and 2,003 birds in 2015 and 2021, respectively. When including a 2km buffer, these numbers increased to 2,848 (2015) and 10,194 birds (2021), respectively. NatureScot in its advice dated 13 October 2022 noted “that the buffer included a high density of puffin in the June surveys”. The next highest population count within the array area was 131 birds in July 2021, or 680 birds in April 2021 when encompassing the array area plus 2km buffer. Few puffin were recorded during the non-breeding season.

8.10 Apportioning of puffin

8.10.1 The citation population for puffin at North Caithness Cliffs SPA is for 38,300 individuals but the most recent count found 6,106 individuals.

8.10.2 Published foraging ranges for puffin (mean maximum foraging range = 137.1km, Woodward *et al.* 2019) suggest that breeding individuals from North Caithness Cliffs SPA could occur at HWL, as well as the Moray Firth offshore wind farms.

8.10.3 In the assessment presented in the EIA Report and supporting appendices, the counts of individual puffin were converted to pairs using a ratio of 1 individual = 0.67 pairs. Although this conversion ratio was in line with MSS and NatureScot advice this conversation factor only applies to guillemot and razorbill and not to puffin. Therefore outputs required scaling to correct for this (Addendum of Additional Information, Appendix B, Annex B).

8.10.4 An apportioning weighting of 0.698 was derived for puffin at the North Caithness Cliffs SPA during the breeding season. Therefore, it should be assumed that 69.8% of puffin occurring in the HWL and relevant buffer area during the breeding season should be apportioned to the North Caithness Cliffs SPA.

8.11 Puffin mortality from the HWL proposal in isolation

Predicted displacement and barrier effects

8.11.1 Displacement and barrier effects from the HWL proposal on North Caithness Cliffs SPA puffin population were estimated using both SeabORD and matrix approaches. For puffin, a displacement rate of 60% was used in SeabORD and the displacement matrix, with mortality rates of 1%, 3% and 5% assumed in the matrix approach. As presented in Appendix 12.4. Marine Ornithology Displacement Analysis, HWL assumed a 0.5km buffer in SeabORD while the matrix approach outputs were presented with and without a 2km buffer.

Predicted puffin mortalities

8.11.2 Displacement matrix predicted mortalities, even without a 2km buffer, were higher than estimated SeabORD mortalities, with annual mortalities ranging from 1.49 puffin to 137 puffin depending upon the approach taken, as seen in Table 7. This was likely due to high abundances of puffin in June 2015 and June 2021 giving high seasonal mean peaks which the SeabORD approach is not sensitive to. This is because SeabORD models individual birds flying out from the colony during the breeding season with use of sea areas varying according to the model parameters and assumptions rather than any empirical information on bird abundance at sea. By contrast, the matrix approach uses estimated abundance of birds within the development area so mortality estimates will be directly related to changes in estimated abundance. Also, SeabORD models displacement and barrier effects on adult birds and those from the North Caithness Cliffs SPA only. This in comparison to the matrix approach which estimates displacement effects on all birds, including non-breeding adults and birds that do not originate from the North Caithness Cliffs SPA.

Table 7. Estimates of apportioned adult puffin mortalities (number of birds per annum) from the HWL proposal in isolation displacement and barrier effects using matrix and SeabORD approaches, for the North Caithness Cliffs SPA. These are scaled numbers

to account for incorrect application of a conversion factor. SeabORD outputs are taken from Addendum of Additional Information; Annex B.

Modelling approach	Buffer	Mortality rate	Numbers of birds
SeabORD (moderate environmental conditions)	0.5km	n/a	2.69
SeabORD (good environmental conditions)	0.5km	n/a	1.49
Matrix (60% displacement)	0km	1%	4.9
Matrix (60% displacement)	0km	3%	15.4
Matrix (60% displacement)	0km	5%	25.1
Matrix (60% displacement)	2km	1%	27.2
Matrix (60% displacement)	2km	3%	81.6
Matrix (60% displacement)	2km	5%	136.8

Non-breeding season

8.11.3 In the spring and autumn migration periods, a total of 6 puffin were seen in the HWL proposal array area and 2km buffer, 2 of which were within the array area itself. Therefore, estimated displacement impacts from the non-breeding season, once apportioned back to the North Caithness Cliffs SPA, were close to zero.

Assessing puffin population response in isolation

8.11.4 As represented in the Addendum of Additional Information, a PVA was used to model puffin population response to the HWL proposal in isolation over a 25 year period (2027-2052) following an initial 'burn in' period of 10 years with no offshore wind farm effects. Three scenarios were modelled, using SeabORD and matrix outputs, as seen in Table 8.

Table 8. Forecast response of the North Caithness Cliffs SPA puffin population to displacement and barrier mortality from the HWL proposal in isolation, over a 25 year period of offshore wind farm operation (2027-2052). CGR: counterfactual of growth rate; CPS: counterfactual of population size (Reproduce from Addendum of Additional Information; Annex C; Table 7.

Scenario	Population size (adult individuals; year = 2052)	CGR	CPS
0. Baseline (no HWL proposal)	1,310	-	-
1. SeabORD (moderate prey year; buffer = 0.5km)	1,270	0.999	0.966
2. SeabORD (good prey year; buffer = 0.5km)	1,289	0.999	0.982
3. Matrix (60% displacement / 1% mortality; buffer = 2km)	1,088	0.993	0.831

8.11.5 Using SeabORD, the estimated effects from the HWL proposal in isolation, over 25 years of operation, resulted in the population size of the puffin qualifying feature of the North Caithness Cliffs SPA being predicted to be 97%-

98% of the forecast population size without the estimated HWL proposal effects. Using a displacement matrix approach, due to the much larger effects estimated, the population of the puffin qualifying feature of the North Caithness Cliffs SPA was predicted to be 83% of the size it would be without the HWL proposal effects, as seen in Table 8.

8.11.6 NatureScot used the SeabORD scenarios rather than the displacement matrix to inform its advice and concluded that the HWL proposal in isolation would not have an adverse effect on site integrity of North Caithness Cliffs SPA with respect to puffin.

8.11.7 RSPB Scotland in its response dated 20 February 2023, raised concerns about the absence of 2km buffer in the SeabORD-derived impacts and so relied on the displacement matrix PVA outputs with a 2km buffer to inform its response. RSPB Scotland based its advice on scenarios with 3% and 5% mortality, rather than the 1% mortality presented in Table 8.

8.12 Puffin mortality from HWL proposal in combination

8.12.1 Information on the estimated effects of the three Moray Firth offshore wind farms (Beatrice, Moray East and Moray West) was obtained from the Moray West RIAA. Moray West calculated puffin displacement mortalities using the matrix approach, assuming a displacement rate of 60% and a mortality rate for displaced birds of 1% and 2%, as seen in Table 9. These effects were combined with predicted displacement effects from the HWL proposal to assess in combination impacts on the puffin population.

Table 9. Apportioned puffin displacement mortalities (number of birds per annum) for the three Moray Firth offshore wind farms, apportioned to North Caithness Cliffs SPA. Information from the Moray West RIAA (reproduced from Appendix 12.5. Marine Ornithology Population Modelling; Appendix A3; Table A3.2.1).

Offshore Wind Farms	60% displacement / 1% mortality	60% displacement / 2% mortality
Moray West	0.99	1.98
Moray East	13.00	25.99
Beatrice	5.93	11.87
Cumulative total	**19.92**	**39.84**

Puffin population response in combination

8.12.2 The NE PVA tool was run to assess the population response of the puffin qualifying feature of the North Caithness Cliffs SPA to predicted effects of the Moray Firth offshore wind farms in the absence of the HWL proposal, assuming a mortality rate of 1% (Scenario 4) and 2% (Scenario 5). The puffin population response to displacement effects from the HWL proposal in combination with Moray Firth offshore wind farms was then assessed, based on matrix Moray Firth offshore wind farms impacts at 1% mortality (i.e., Scenario 4) plus the HWL proposal SeabORD impacts under moderate conditions (Scenario 6) and under good conditions (Scenario 7). The

population response (CPR and CPS) is presented for all seven scenarios, including for the HWL proposal in isolation, in Table 10.

Table 10. Forecast population response of the puffin qualifying feature of the North Caithness Cliffs SPA to displacement impacts from HWL proposal in combination with Moray Firth offshore wind farms, over a 25 year period of offshore wind farm operation (2027-2052). CGR: counterfactual of growth rate; CPS: counterfactual of population size (reproduced from Addendum of Additional Information; Annex C; Table 4).

Scenario	Modelling approach	Population size (year: 2052)	CGR	CPS
0. Baseline	no offshore wind farm impacts	1,310	-	-
1. HWL proposal in isolation	SeabORD moderate prey	1,270	0.999	0.966
2. HWL proposal in isolation	SeabORD good prey	1,289	0.999	0.982
3. HWL proposal in isolation	Matrix (60% displacement; 1% mortality)	1,088	0.993	0.831
4. Moray Firth offshore wind farms only	Matrix (60% displacement; 1% mortality)	1,151	0.995	0.875
5. Moray Firth offshore wind farm only	Matrix (60% displacement; 2% mortality)	1,005	0.990	0.764
6. HWL proposal + Moray Firth offshore wind farms	SeabORD moderate prey + Matrix (60% displacement; 1% mortality)	1,110	0.994	0.844
7. HWL proposal + Moray Firth offshore wind farms	SeabORD good prey + Matrix (60% displacement; 1% mortality)	1,129	0.994	0.857

8.12.3 The forecast population response of the puffin qualifying feature of the North Caithness Cliffs SPA to displacement impacts assuming the matrix approach for Moray Firth offshore wind farms was a decline in end population size to 76%-87% of forecast unimpacted end population size. HWL proposal impacts in combination with Moray Firth impacts, assuming 1% mortality, resulted in small further reductions in population size, compared with unimpacted, of 84%-86%.

8.12.4 RSPB Scotland, in advice dated 23 February 2023, raised concerns about the validity of merging SeabORD and matrix approaches to calculate in combination impacts (Scenarios 6 and 7 above). Specifically, RSPB Scotland stated “SeabORD and the matrix are two very different approaches and combining them is misleading. In particular, SeaBORD includes chick mortality in the model calculations while the matrix approach does not. For long lived species, the abandonment of a breeding attempt (and consequent chick

mortality) is a much more likely response to additional stress associated with the presence of a wind farm than adult mortality, as considered by the matrix approach."

8.12.5 RSPB Scotland also noted that HWL's SeabORD approach used a buffer of 0.5km instead of the recommended 2km. Whilst RSPB Scotland recognised the greater biological realism of the SeabORD model, its concerns about merging predicted effects from matrix and SeabORD outputs for in combination assessment and lack of 2km buffer, meant RSPB Scotland used a matrix only approach to estimate displacement effects, and used these in a PVA to inform its response of 23 February 2023. This matrix-only scenario is not presented here, but used matrix approaches to assess both the HWL proposal and Moray Firth impacts and then applied these matrix-only impacts in PVA. Forecast population response to matrix-only in combination effects was a CGR of 0.984 and 0.975, assuming 3% and 5% mortality, respectively (RSPB Scotland, 23 February 2023) which is a lower CGR than was produced by any of the scenarios above, i.e., greater impacts on the puffin population.

8.12.6 Acknowledging the limitations of the matrix approach, RSPB Scotland recommended that SeabORD with a 2km buffer be used to assess displacement and barrier effects for the Moray Firth offshore floating wind farms, to inform in combination impacts for the HWL proposal application. RSPB Scotland recommended that this should be carried out using the CEF.

8.12.7 NatureScot also recognised the benefits of using only SeabORD (rather than matrix approaches) to assess in combination effects of both the HWL proposal and the Moray Firth offshore wind farms. NatureScot also wanted to understand the magnitude of displacement and barrier effects from SeabORD using a 2km buffer (rather than the 0.5km buffer used by HWL). Additionally, NatureScot noted that in SeabORD there are sensitivities around setting the utilisation distribution within the distance decay function, potentially resulting in birds utilising an unrealistically small component of the foraging range and only close to the colony. Consequently, NatureScot commissioned the UK Centre for Ecology & Hydrology ("UKCEH") to undertake an assessment of the displacement and barrier effects of the Moray Firth offshore wind farms in combination with the HWL proposal, using only the SeabORD approach, within the CEF.

8.13 Cumulative Effects Framework

CEF inputs

8.13.1 Within the CEF, effects of the HWL proposal and the three consented Moray Firth offshore wind farms were assessed using SeabORD, with a 2km buffer (i.e., a 2km border using SeabORD terminology, SeabORD user guide Mobbs et al. 2017). The distance decay utilisation distribution was adjusted so that the modelled distribution of puffin across their foraging range was more biologically realistic than them being unrealistically concentrated in the vicinity of their colony. Other than adjusting the buffer and distance decay utilisation distribution, the CEF was run using the same input parameters as those used by the applicant, i.e., a 60% displacement rate and the population model

projected over 2016-2052, with no impacts during the first 10 years, followed by 25 years of offshore wind farm effects. The SeabORD tool within the CEF uses an improved approach to calibrating prey levels than the standalone tool that was used to generate the applicant's predicted effects from SeabORD which could be another reason for differing outputs from the CEF SeabORD and the applicant's use of SeabORD.

Distance decay function

8.13.2 The SeabORD tool was run using a distance decay function to model seabird foraging behaviour. HWL set the distance decay to mean maximum foraging range plus one SD (Woodward et al. 2019), with the proportion of foraging occurring within this identified range to be 0.975. This resulted in the Utilisation Distribution ("UD") being focussed in areas close to the colony, resulting in the SeabORD tool predicting a low proportion of birds using areas further offshore, including the HWL proposal array area. NatureScot deemed this unrealistic and, when using the SeabORD tool within the CEF, set the distance decay such that puffins were distributed further offshore, which consequently increased the modelled proportion of birds using the HWL proposal array area.

Chick mortality

8.13.3 Displacement and barrier impacts can directly affect an adult seabirds body condition, which can cause the adults to die or desert its chick(s) if it fails to meet its daily energy requirements. This will cause chick mortality to increase, even if the adult does not die. For long lived species such as seabirds, deserting their chick in favour of their own survival is more common under unfavourable conditions. Consequently, PVAs should ideally model both decreases in adult survival and in chick survival (i.e., reductions in productivity) together. However, it was unclear from the information provided by HWL whether reductions in chick survival due to adult mortality, reduced food provision to chicks, or abandonment of chicks during the breeding season had been accounted for in the PVA models. Therefore, CEF scenarios modelled puffin population response to offshore wind farm impacts with and without offshore wind farm-induced chick-mortality. For each scenario, 10 simulations were run.

CEF outputs

8.13.4 Whilst the CEF outputs did not include mortalities (numbers of birds dying per annum) these can be calculated from the CEF outputs of percentage point changes in adult survival by applying it to the population size (i.e. mean percentage point change in adult survival, divided by 100, multiplied by a population size of 3,053 individuals) , as seen in Table 11.

Table 11. Predicted change in puffin adult survival and numbers of puffin mortalities, per annum, in the presence of displacement and barrier effects from the HWL proposal in isolation and in combination with the Moray Firth offshore wind farms (Values for mean % point change in adult survival were taken from the unpublished report for

NatureScot, generated by the CEF tool. Puffin mortalities were calculated by Marine Scotland Science as described above.)

Scenario	Mean % point change in adult survival	Puffin mortalities
1. HWL proposal in isolation	-0.082%	2.5 individuals
2. HWL proposal in combination with Moray Firth offshore wind farms	-0.293%	9.0 individuals

8.13.5 Four scenarios were run in the CEF: the displacement and barrier effects from the HWL proposal in isolation and in combination with the consented Moray Firth offshore wind farms, each with and without immature mortality, as seen in Table 12.

Table 12. Response of the North Caithness Cliffs SPA puffin population to displacement and barrier effects from the HWL proposal in isolation and in combination with Moray Firth offshore wind farms, over a 25 year period of offshore wind farm operation (2027-2052), based on the SeabORD approach in the Cumulative Effects Framework. CGR: counterfactual of growth rate; CPS: counterfactual of population size. (Values for Population Size were taken from the unpublished report for NS, generated by the CEF tool. CGR and CPS values were calculated by NatureScot, using population size information from the CEF report.)

Scenario	Chick mortality included?	Population size (year: 2052)	CGR[1]	CPS
0. Baseline (no offshore wind farms)	No	1,338[2]	-	-
1. HWL proposal in isolation	No	1,234	0.993	0.933
2. HWL proposal in isolation	Yes	1,248	0.998	0.929
3. HWL proposal in combination with Moray Firth offshore wind farms	No	1,124	0.993	0.832
4. HWL proposal in combination with Moray Firth offshore wind farms	Yes	1,063	0.991	0.794

[1]Counterfactual of annualised growth rate, [2] Calculated as the average baseline population size in 2052 for each of the four scenarios.

8.13.6 For the HWL proposal in isolation, the CEF SeabORD approach predicts larger decreases in the North Caithness Cliffs SPA puffin population size. The CEF SeabORD approach predicted puffin population size to be around 93% (CPS value of 0.93) of unimpacted population size whereas HWLs SeabORD approach predicted population size to be 97-98%. This difference may be due to the CEF approach including a 2km buffer, compared with a 0.5km buffer used by HWL. Additionally, a different distance decay function being used in

the CEF that distributed modelled birds further offshore could contribute to the difference.

8.13.7 Comparing puffin population response to the HWL proposal effects in combination with Moray Firth offshore wind farm effects is more difficult due to the matrix approach being used by the applicant but not in the NatureScot CEF approach. However, the CEF approach predicted a slightly greater decrease in puffin population size, relative to an unimpacted population, of 79%-83% (CPS values of 0.79 - 0.83), compared with the applicant's in combination approach using SeabORD and the matrix approach combined of 84%-86% (see , Scenario 6 and 7 in Table 10).

8.13.8 NatureScot advised that the HWL proposal in-combination with the Moray Firth wind farms would have an adverse impact on puffin qualifying features at North Caithness Cliffs SPA, and the RSPB maintained its objection.

8.14 Puffin - conclusion for 25 or 30 year operational period

8.14.1 In reaching its conclusion, MD-LOT has considered the conservation objectives, the populations at the sites, the predicted levels of impact and population consequences, the precaution in the assessment methods and the consultation responses from NatureScot and RSPB Scotland. MD-LOT conclude that, subject to the appliance of conditions, there will be no adverse effect on the site integrity of the North Caithness Cliffs SPA in respect of the puffin qualifying interest as a result of the HWL proposal in isolation. However, MD-LOT conclude that there could be an adverse effect on the site integrity of the North Caithness Cliffs SPA in respect of the puffin qualifying interest as a result of the HWL proposal in combination with the Moray Firth offshore wind farms.

8.15 Reducing the operational period from 30 to 10 years

8.15.1 NatureScot, in its advice dated 13 March 2023, indicated to MD-LOT that a 10 year consent period might remove the potential for an adverse effect on site Integrity to puffin as a qualifying feature of North Caithness Cliffs SPA from displacement effects in combination with consented Moray Firth wind farms. In its subsequent advice, NatureScot provided PVA outputs for 30 years, as seen in Table 133 and 10, 15 and 25, as seen in Table 14. Having reviewed these outputs, NatureScot advised that a consent period of 10 years is not likely to result in an adverse effect on site integrity for the puffin qualifying feature of North Caithness Cliffs SPA in combination with consented Moray Firth wind farms from displacement effects.

Table 13. PVA outputs a 30 year consent duration for the HWL proposal alone and In combination with consented Moray Firth wind farms with and without chick mortality for puffin as a qualifying feature of North Caithness Cliffs SPA (reproduced from NatureScot email to MD-LOT: 14 March 2023)

Scenario	CPS	COGR	CAGR
NatureScot PVA Alone - Immatures Zero	0.933	0.945	0.993

NatureScot PVA Alone - Immatures Included	0.929	0.941	0.998
NatureScot PVA In combination - Immatures Zero	0.832	0.829	0.993
NatureScot PVA In combination - Immatures Included	0.794	0.795	0.991

Table 14. PVA outputs for 10, 15 and 25 year consent duration for Pentland Offshore Wind Farm in combination with consented Moray Firth wind farms with and without chick mortality for puffin as a qualifying feature of North Caithness Cliffs SPA (reproduced from NatureScot email to MD-LOT: 14 March 2023).

Scenario	Year	CPS	COGR	CAGR
NatureScot PVA In combination - Immatures Zero	10	0.942	0.942	0.995
NatureScot PVA In combination – Immatures Zero	15	0.904	0.895	0.993
NatureScot PVA In combination - Immatures Zero	25	0.832	0.829	0.993
NatureScot PVA In combination - Immatures Inc.	10	0.925	0.929	0.993
NatureScot PVA In combination - Immatures Inc.	15	0.881	0.884	0.992
NatureScot PVA In combination - Immatures Inc.	25	0.794	0.795	0.991

8.15.2 For kittiwake as a qualifying interest of North Caithness Cliffs SPA North for the HWL proposal alone and in combination scenarios, HWL provided CPS values for a 10 year operational period, as seen in Table 14. These were back calculated from the 25 year PVA using the following formula: CPSx = 1 – [(1 - CPS25) * x/25].

Table 15. PVA CPS values at the end of 25 and 10 years consent duration for kittiwake as a qualifying feature of North Caithness Cliffs SPA (reproduced from application email to MD-LOT: 17 March 2023)

Scenario	25 Years	10 years
1 – the HWL proposal SeabORD and CRM mean densities	0.981	0.992
2 – the HWL proposal SeabORD and CRM max densities	0.975	0.990
3 – the HWL proposal SeabORD and CRM mean densities Moray Firth (matrix 30% / 2%) and CRM mean densities	0.96	0.984
4 - North Sea wind farm non-breeding CRM mean densities (excluding the Project and Moray Firth)	0.873	0.949
5 - Scenarios 3 and 4 together	0.84	0.936

8.15.3 In reviewing the CPS for these 5 scenarios over a 10 year operational period, NatureScot advised:

- No adverse effect on site integrity from the HWL proposal alone effects (as per scenarios 1 & 2)
- No adverse effect on site integrity from the HWL proposal in combination with Moray Forth wind farms (as per scenario 3)
- Potential for adverse effect on site integrity from the HWL proposal in combination with North Sea wind farms (as per scenarios 4 & 5) – noting that the CPS value of 0.936 for scenario 5 is of most concern.

8.15.4 However, in light of the lack of empirical evidence to help validate many of the elements within the assessment of predicted impacts, NatureScot recommend that, should the Scottish Ministers be minded to grant consent for a 10 year period, appropriate operational monitoring at the development site would be helpful to enable validation of these predictions. NatureScot also advised that they would be willing to work with HWL to consider what data collation and where may be relevant to post consent monitoring, which would enable validation of these predictions and potentially allow for an extension to the 10 year consent period.

8.16 Puffin conclusion for a 10 year operational period

8.16.1 In reaching its conclusion for puffin, MD-LOT has considered the conservation objectives, the populations at the sites, the predicted levels of effect and population consequences, the precaution in the assessment methods and the advice from NatureScot, RSPB Scotland and MSS. MD-LOT conclude that, subject to the appliance of conditions and a 10 year consent, there will be no adverse effect on the site integrity of the North Caithness Cliffs SPA in respect of the puffin qualifying interest as a result of the HWL proposal in isolation or in combination with the Moray Firth offshore wind farms.

8.17 Kittiwake conclusion for a 10 year operational period

8.17.1 In reaching its conclusion for kittiwake, MD-LOT has considered the conservation objectives, the populations at the sites, the predicted levels of effect and population consequences, the advice from NatureScot, Natural England, RSPB Scotland and MSS, and the precaution in the assessment methods. The precaution built into the assessment includes the use of avoidance rates ranging from 95% to 99% (Hornsea Four 2021), rather than the 98.9% advised for projects in the English North Sea (a change in avoidance rate from 98% to 99% would result in a halving of estimated collisions). The interim advice published by NatureScot in January 2023 (NatureScot 2023) indicated that an avoidance rate of 99.2% should be used for kittiwake, as did the April 2023 advice provided by Natural England in in relation to Berwick Bank offshore wind farm. The adoption of the newly advised rate of 99.2% rather than 98.9% would reduce cumulative collision totals by approximately 25%. JNCC recently commissioned and published a review of seabird avoidance rates which calculated an avoidance rate of 99.7% for kittiwake, 99.2% for black-headed gull, and 99.24% for ‘Gull’ (Ozsanlav-Harris et al 2023). All these avoidance rates are greater than those assumed in the HWL application and would result in a substantial reduction in the estimated number of kittiwake collisions. The results of the seabird avoidance behaviour study at Aberdeen Offshore wind farm also indicated high levels of avoidance by kittiwake (AOWFL 2023). MD-LOT conclude that, subject to the appliance of conditions and a 10 year consent, there will be no adverse effect on the site integrity of the North Caithness Cliffs SPA in respect of the kittiwake qualifying interest as a result of the HWL proposal in isolation or in combination with the Moray Firth offshore wind farms and North Sea offshore wind farms.

8.18 Faray and Holm of Faray SAC, Inner Hebrides and the Minches SAC, Sanday SAC, Moray Firth SAC

8.18.1 NatureScot advised that harbour porpoise, bottlenose dolphin, grey seal and harbour seal could suffer permanent threshold shift ("PTS") auditory injuries, be disturbed by underwater noise and other impact pathways associated with the operational phase of the HWL proposal. However, the Ultra-Short Baseline ("USBL") equipment used will be operated at a level below that of PTS and a Marine Mammal Management Plan is to be implemented. The developer's research also shows that <1 harbour seal is predicted to experience PTS-onset per piling day.

8.18.2 Examples of underwater noise-generating activities to be carried out include geophysical surveys, vessel noise and construction activities. The potential for disturbance to harbour seals is considered to be of limited spatial and temporal extent. These activities will also be conducted intermittently with a low occurrence of qualifying interest species. Estimates using highly conservative figures indicate that, over the course of geophysical and UXO campaigns, <1 harbour seal would be affected on a survey day. Further studies also indicated no estimated drop in harbour seal population within the north coast management unit ("NCO MU") after piling works have been carried out. In turn, the conservation status of harbour seals within the MU where Sanday SAC is located would remain unaffected. Only minor behavioural effects on harbour seals hauling out in the Sanday SAC have been predicted, with a very small number (<0.01%) expected to be disturbed in its seasonal foraging grounds.

8.18.3 Other potential impact pathways during the operational phase of the HWL proposal include displacement/barrier effects, entanglement and collision. It is believed that the design of the export cable corridor and offshore array area will not generate any barrier or displacement effects on habitat use by harbour seals, with models indicating that <0.1% of the NCO MU would experience restrictions from the array. The export cable corridor will be readily traversable for any qualifying interest species.

8.18.4 There is no risk of direct entanglement with equipment relating to the HWL proposal. However, the risk of secondary entanglement with discarded fishing equipment by animals using the array area exists, particularly in the case of monofilament fishing nets and lines. HWL plans to monitor and remove debris from the mooring lines and cables to decrease the likelihood of any such entanglements.

8.18.5 It is believed that the scale of the floating infrastructure should discourage qualifying interest species from collisions. The associated mooring infrastructure has been designed to limit movement of the WTGs and there are no moving substructures so the position of the infrastructure should not change dramatically. Animals are expected to be able to swim around these structures readily.

8.18.6 Consequent to the above, NatureScot concluded that there will be no adverse effect on site integrity of the Faray and Holm of Faray SAC, Inner Hebrides and the Minches SAC, Sanday SAC or Moray Firth SAC. MD-LOT concludes that there will be no adverse effect on site integrity of these SACs from the HWL proposal in isolation.

8.19 River Thurso SAC, Berriedale and Langwell Waters SAC, Little Gruinard River SAC, Langavat SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC, River Bladnoch SAC, River Naver SAC, River Borgie SAC, River Spey SAC, River Oykel SAC, North Harris SAC, River Dee SAC, River Moriston SAC, River South Esk SAC

8.19.1 NatureScot advised that Atlantic salmon and fresh water pearl mussel could suffer disturbance to, and possible alteration of, migration routes due to underwater noise generated from construction activities and further effects on migration from EMFs. These effects would be felt directly in the case of Atlantic salmon and indirectly in the case of the fresh water pearl mussel as the Atlantic salmon plays a vital role in its life-cycle.

8.19.2 It is believed that potential impacts on Atlantic salmon associated with construction/installation, operation and maintenance and decommissioning will be minimal on the basis that Atlantic salmon can readily move out of or avoid the main area of potential impact. Evidence suggests that adult Atlantic salmon in the immediate vicinity of underwater noise are generally able to vacate the area and avoid any likely physical injury. Larvae are less mobile but are restricted to rivers, away from the site of works. By the time smolts reach the sea they are mobile enough to avoid the area of potential impact.

8.19.3 For fleeing individuals, the nearest SAC is the River Thurso SAC, located 21km from the array area. Injury potential for Atlantic salmon has been determined to be raised within 250m of the site of works. Thus, even within the nearest SAC, Atlantic salmon will have adequate range to move to in order to avoid potentially damaging underwater noise. This large range of similar habitat, coupled with the relatively short 63 day period of piling works, is also expected to mitigate the potential effects of temporary threshold shifts in hearing that would otherwise damage an individual salmon's ability to detect predators and prey.

8.19.4 UXO clearance would cause an increase in underwater noise over a period of several seconds with the potential to injure or alter the behaviour of Atlantic salmon. A desk-based assessment indicates that it is unlikely the developer will encounter any UXO in the offshore site. It is also believed that, should any UXO be encountered, it will be possible for it to be avoided without the necessity for clearance works. In the event that clearance is necessary, an impact radius of 810m from the source has been used in assessment models. It is estimated that all recoverable, TTS, potential mortality and mortality injuries will be localised to within hundreds of metres from detonation, but adult salmon would be expected to flee the detonation.

8.19.5 Atlantic salmon have magnetic sensors, making them sensitive to EMFs. Their skeletons or magnetically sensitive and evidence suggests they may use naturally occurring magnetic fields as a navigation tool. Thus, EMFs generated by the HWL proposal's cables, export and array area, could have the potential to adversely affect Atlantic salmon. This risk increases in waters less than or equal to 20m in depth. However, studies on EMFs effect on Atlantic salmon are inconclusive and the water depths seaward from where the export cable exits the HDD tunnel are expected to be 20m at minimum. Most migratory salmonids swim within the top 5m of the water column, making it less likely that they would be affect by any EMF emissions from the export and inter-array cables on the seabed. Encounters with the dynamic portion of cables at the wind farm area are more likely but modelling results indicate that only low levels of EMF are anticipated to be released by the HWL proposal's cables, particularly for the static portion if burial depths are achieved. The combined effect will be only small and temporary effects, if any, on the migratory behaviour of Atlantic salmon.

8.19.6 As no adverse effects are anticipated on Atlantic salmon from any of the previously discussed impact pathways, no knock-on effects on fresh water pearl mussels are anticipated.

8.19.7 Consequent to the above, NatureScot concluded that there will be no adverse effect on site integrity of the River Thurso SAC, Berriedale and Langwell Waters SAC, Little Gruinard River SAC, Langavat SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC, River Bladnoch SAC, River Naver SAC, River Borgie SAC, River Spey SAC, River Oykel SAC, North Harris SAC, River Dee SAC, River Moriston SAC or River South Esk SAC. MD-LOT concludes that there will be no adverse effect on site integrity of these SACs from the HWL proposal in isolation.

9 In combination assessment

9.1 MD-LOT has carried out an in combination assessment to ascertain whether the HWL proposal will have a cumulative effect with other plans or projects which, in combination, would have the potential to affect the qualifying interests of the Faray and Holm of Faray SAC, Inner Hebrides and the Minches SAC, Sanday SAC, Moray Firth SAC, River Thurso SAC, River Naver SAC, River Borgie SAC, Berriedale and Langwell Waters SAC, River Spey SAC, Little Gruinard River SAC, River Oykel SAC, Langavat SAC, North Harris SAC, River Dee SAC, River Moriston SAC, River South Esk SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC, River Bladnoch SAC, North Caithness Cliffs SPA, Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA,

Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA, and Ailsa Craig SPA.

9.2 The following projects currently have an active marine licence, section 36 consent, European protected species licence or basking shark licence and associated AA which identified a likely significant effect on the qualifying interests of the aforementioned SACs and SPAs.

9.3 Orkney Islands Council (per ITPEnergised) - Extended Slipway and Landing Jetty - Scammalin Bay, Island of Faray

9.4 Construction works below MHWS for a new extended slipway (36m x 8m) and landing jetty associated with the proposed Orkney Community Wind Farm - Faray project. The jetty will comprise a causeway measuring a maximum of 55m long by 10m wide, terminating in a square docking structure measuring a maximum 20m by 20m. This project will also include capital dredging of 3870 wet tonnes of sediment.

9.5 Further information can be found here:
Marine Licence - Extended Slipway and Landing Jetty - Scammalin Bay, Island of Faray - 00009361 | Marine Scotland Information & Marine Licence - Capital Dredging and Sea Disposal - Scammalin Bay, Island of Faray - 00009362 | Marine Scotland Information

9.6 Beatrice Offshore Wind Farm

9.7 Operation of the Beatrice Offshore Windfarm, which is located in the outer Moray Firth, 13.5km from the Caithness coast. The total area of the development is 131.5km^2.

The development comprises 84 turbines and the eastern edge of the development site is adjacent to the proposed Moray Firth Offshore Renewables Limited Eastern Development Area. The operational lifespan of the wind farm is expected to be 25 years. Construction started in April 2017 and the final turbine was installed in May 2019.

9.8 Further information regarding the project can be found here:
Beatrice Offshore Windfarm | Marine Scotland Information

9.9 Neart na Gaoithe Offshore Wind Farm

9.10 Construction and operation of a wind farm located 15.5km east of Fife Ness in the Firth of Forth. Consent has been granted for up to 54 wind turbines with piled jacket foundations. The operational lifespan of the project is expected to be 50 years. The project is currently under construction.

9.11 Further information can be found here:
Neart na Gaoithe Offshore Wind Farm (Revised Design) | Marine Scotland Information

9.12 Inch Cape Offshore Wind Farm

9.13 Construction and operation of a wind farm and associated transmission infrastructure 15-22km east of the Angus coastline. The wind farm will consist of a maximum of 72 wind turbines, with up to two offshore substation platforms and up to two export cables making landfall at Cockenzie, East Lothian. Construction activities are anticipated to start in 2021 with works taking approximately 24 months over a 3-year period.

9.14 Further information regarding the project can be found here:
Inch Cape Offshore Windfarm (Revised Design) | Marine Scotland Information

9.15 Hywind Scotland Pilot Park

9.16 Five 6 MW turbines have been installed approximately 25km off the coast at Peterhead, Northeast Scotland, just outside the 12 nautical mile territorial water limit. The project will be expected to produce up to 135 GWh per year of electricity. The turbines are positioned between 800 to 1,600m apart and attached to the seabed by a three-point mooring spread and anchoring system. Three anchors are required per turbine and the radius of the mooring system extends 600 to 1,200m out from each turbine. The turbines are connected by inter-array cables which may require stabilisation in some locations. The export cable, which transports electricity from the Pilot Park to shore at Peterhead, is buried where seabed conditions allow. Where this is not possible cable protection in the form of concrete mattresses and rock is required. Both the inter-array and export cables have 33 kV transfer voltage. The export cable comes ashore at Peterhead and connects to the local distribution network at SSE Peterhead Grange substation. The project has finished construction and moved into the operational phase.

9.17 More information can be found here:
Hywind Scotland Pilot Park | Marine Scotland Information

9.18 Kincardine Offshore Wind Farm

9.19 Kincardine Offshore Windfarm ("KOWL") is a demonstrator floating offshore windfarm development that is located to the south east of Aberdeen, approximately eight miles from the Scottish coastline in approximately 60 to 80m of water.

9.20 The development is considered a commercial demonstrator site, which utilises floating semi-submersible technology to install six turbines including a temporary data gathering platform of 2MW. The maximum generating capacity of all six turbines will not exceed 50MW. The proposal also includes inter-array cabling to the connection point at the onshore Redmoss substation, Altens, Aberdeen. The 2MW turbine was deployed in September 2018, while the other five turbines (9.5MW each) will be deployed after September 2020. Further information regarding the project can be found here.

9.21 Further information can be found here:
Kincardine Offshore Windfarm | Marine Scotland Information

9.22 Global Energy Nigg Ltd - Removal of Two Dolphin Moorings - Nigg Energy Park Cromarty Firth

9.23 Global Energy Nigg Ltd propose to remove two mooring dolphins proximal to the south quayside at Nigg Energy Park, Cromarty Firth. The mooring dolphins will be dismantled and removed to allow unobstructed and safe passage to and from the south quayside. The dolphins comprise two separate steel mooring frames each supported on 4 no. steel tubular piles of 42-inch diameter. The mooring frames are approx. 7.5m^2 and positioned some 65-70m apart. The piles penetrate the seabed to a depth of about 40 feet, which equates to -22m CD.

9.24 More information can be found here:
Marine Licence - Removal of Two Dolphin Moorings - Nigg Energy Park Cromarty Firth - 06291 | Marine Scotland Information

9.25 BEAR Scotland - Bridge Maintenance Works - Kessock Bridge, Inverness-shire

9.26 This licence covers routine maintenance activities to be conducted on the bridge over a period of 5 years. All works will be highly localised and take place within the immediate vicinity of the bridge. Apart from scour repairs and fender replacement, all maintenance activities will take place above Mean High Water Springs. In most cases, activity duration is likely to be less than three months and for several activities, duration will be less than a few weeks. The exception being the painting of the superstructure which will take approximately 4 years to complete.

9.27 More information can be found here:
Marine Licence – Bridge Maintenance Works – Kessock Bridge, Inverness-shire - 06820/00009583 | Marine Scotland Information

9.28 Wellboat Discharge - Various Fish Farms - Inner Hebrides and the Minches SAC

9.29 A number of marine licences have been granted to allow the discharge of chemotherapeutants from wellboats alongside the cages at finfish farms in the Inner Hebrides and the Minches SAC. Azamethiphos, deltamethrin, cypermethrin and hydrogen peroxide are to be used in the treatment of sea lice. Substance quantities are conditioned on the marine licence to ensure that there will be no adverse environmental effects from the discharge.

9.30 Scottish Hydro Electric Power Distribution ("SHEPD") - Geophysical & Geotechnical Surveys - Argyll

9.31 SHEPD are undertaking geophysical and geotechnical cable surveys of 20 existing cables within the Argyll marine region. The proposal includes the use of Ultra-Short Baseline ("USBL"); Sub-Bottom Profiler ("SBP") and combined SBP/side scan sonar. A total of 20 cables, and 80.2km of cable will be surveyed, with a potential total survey area of 80.9km^2. Survey activities across the Argyll geographical area expected to take 36.8 days and are scheduled to be undertaken from September 2020 to 01 September 2023.

9.32 Further information can be found here:
MS EPS 29 2019 0 & MS BS 07 2019 0 - Regional - SHEPD - Geophysical & Geotechnical Surveys - Argyll - Appropriate Assessment details - Objective ECM (scotland.gov.uk)

9.33 Seagreen Wind Energy Limited - Geophysical Surveys - Seagreen 1A Cable Route

9.34 Seagreen proposes to install a further export cable to enable the subsequent build out of the Seagreen Alpha and Bravo Offshore Wind Farms. This export cable is to be known as Seagreen 1A and will make landfall at Cockenzie in the Firth of Forth. Seagreen propose to undertake geophysical surveys of the planned Seagreen 1A cable route. This will include the use of multi-beam echo sounder, side-scan sonar, sub-bottom profiler, magnetometer, sparker boomer and ultra-short base line. The total survey area covers approximately 548km^2.

9.35 Further information can be found here:
Marine Licence – Construction of Export Cable – Seagreen 1A Export Cable Corridor, Firth of Forth - 00009291/00009923 | Marine Scotland Information

9.36 UK Marine Renewable Power Ltd - Geophysical Surveys - West Colonsay to North Ayrshire

9.37 Geophysical surveys to identify and assess surface and subsurface features within the ScotWind W1 PO site and potential export cable corridor. The equipment used will include multi-beam echo-sounder, side-scan sonar, sub-bottom profiler and ultra-short baseline. Survey campaigns are planned to occur between June 2021 and August 2027, with a total duration of offshore survey activities of approximately 18 months. Surveys may occur at any time of year within this period; however, the surveys are planned to occur in three discrete campaigns, each within the period April to November and lasting up to four months in duration.

9.38 Further information can be found here:
00009313 and 00009314 - UK Mainstream Renewable Power Ltd - Appropriate Assessment Final details - Objective ECM (scotland.gov.uk)

9.39 Beatrice Offshore Windfarm - Geophysical surveys, benthic surveys and visual inspections

9.40 The works involve geophysical surveys at the site of Beatrice Offshore Windfarm transmission infrastructure and turbine sub structures, located in the Outer Moray Firth approximately 13.5km from the Caithness coastline, off the Northeast of Scotland and comprised of 84 fixed wind turbines, two offshore transformer modules, inter-array cables and two subsea export cables. The survey operations are scheduled to be undertaken between June 2020 and December 2023. There will be numerous survey campaigns within this period, with a total duration of 365 days.

9.41 More information can be found here:
European Protected Species Licence - Post-construction geophysical surveys - Beatrice Offshore Wind Farm, Moray Firth - 00007286/00009454 | Marine Scotland Information

9.42 Moray East Offshore Wind Farm and Transmission Infrastructure

9.43 The wind farm is operational with 72 WTG with a maximum generating capacity of up to 1,116 MW and 2 offshore substation platforms and associated transmission infrastructure. The proposals are located on the Smith Bank in the outer Moray Firth (approximately 22km from the Caithness coastline).

9.44 Further information can be found here:
Moray East Offshore Windfarm | Marine Scotland Information

9.45 Ardersier Port Development

9.46 The Ardersier Port Development is located at the former McDermott Fabrication Yard, which lies approximately 7.5km to the west of Nairn, 3km northeast of the village of Ardersier and is bounded by the Moray Firth to the north. The site extends to 307 hectares in total (including marine and terrestrial aspects) and features an existing harbour which is protected by a naturally occurring sand and shingle spit known locally as Whiteness Head. The works involve port entrance/inner channel dredging, quay wall construction/realignment and quayside (berthing) dredging and are scheduled to start in 2019 taking up to 5 years to complete. A dredge of 2,300,000m^3 of sand will be required to deepen the port entrance to -6.5m chart datum. A cutter suction dredger will be used. An area of the inner channel will be dredged to -3m chart datum by either plough dredging, backhoe dredger or land-based equipment. Once dredging has been completed, the new 464m sheet pile wall will be constructed alongside the existing quayside.

9.47 More information can be found here:
Marine Licence - Quay wall construction - Ardersier - 06860/00009479 | Marine Scotland Information

9.48 BT R100 Telecommunications Cable Installation - Orkney Region

9.49 BT are undertaking the installation of 16 armoured fibre optic telecommunications cables in Scottish water, 7 of them in the Orkney Marine Region. This forms part of the Scottish Governments Reaching 100 (“R100”) broadband project to supply 100% of the Scottish population with superfast broadband.

9.50 The project is to install 25-45mm armoured cables with a plough burial method or surface laid and secured with pins and rock armour. Above Mean Low Water Springs (“MLWS”), the cable will be buried to a depth of 2m below the surface. Offshore there is a target burial depth of 1m depth to protect and secure the cables. A post-lay inspection will take place to allow burial of the cable with rock armour where it has been surface laid. During the landing of the cables at either end an excavator will be utilised to dig the cable trench and pull the cables ashore, utilising excavated material to bury the cables and return the beach profile to its original state.

9.51 Further information can be found here:
Marine Licence - Cable Installation - Eday to Westray - 00009561 | Marine Scotland Information

9.52 Ferry Terminal Development - Lochmaddy, North Uist

9.53 George Leslie Ltd. proposes to carry out dredging and sea deposit, rock breaking and impact piling as part of the works associated with the Lochmaddy Ferry Terminal Upgrade in North Uist, Western Isles.

9.54 Dredging and sea deposit activities are scheduled to be undertaken over a 3 month period until completed. Piling works are estimated to take 2 weeks from commencement and rock breaking taking 10 days to complete. After commencement the project as a whole is anticipated to take 12 months.

9.55 A total of 16,000 wet tonnes of material will be dredged from the site and deposited at the designated Stornoway deposit site. Most of the material to be removed by dredging is sediment built up on top of the bedrock and will be removed using a backhoe dredger. There is, however, an area of bedrock immediately adjacent to the pier which requires removing. An excavator mounted pneumatic pecker is to be used to break the rocks ready for removal with the backhoe dredger. A stitch drill mounted on a rig may be required to create voids and weaken the rock before the pneumatic breaker finishing the process to allow the rocks to be removed by the dredger. Both vibratory and impact piling may be used during the works.

9.56 Six new piles, each 660mm diameter, will be installed for the new parallel motion fenders. The simultaneous use of two or more piling rigs will be minimised but remains a possibility. Noise measurements at unweighted source level of up to 175 dB re 1 µPa RMS with a maximum energy in the frequency range of 150Hz to 1.2kHz could be expected. After piling the rock will be drilled to insert toe pins to secure the piles in place. Each pile is anticipated to take 30 minutes to 1 hour to install, depending on the conditions.

9.57 Further information can be found here:
Lochmaddy Ferry Terminal Development | Marine Scotland Information

9.58 Flex Marine Power Ltd - Tidal Turbine and Associated Infrastructure

9.59 Installation of a single 50kW Swimmer Turbine at the southern end of the Sound of Islay. The power will be transmitted to a power unit of Dunlossit Estate via an umbilical cable. The proposed start date is May 2022 with the operational period anticipated to last 5 years up to the end of May 2027.

9.60 Further information can be found here:
Flex Marine Power Ltd | Marine Scotland Information

9.61 Highland Council - Ferry Terminal Development - Uig, Isle of Skye

9.62 The Uig ferry terminal development includes the following components located below Mean High Water Springs:

- Widening of the pier approach way;
- Widening and strengthening of the existing berthing structure;
- Installation of new linkspan, lifting dolphins and bankseat;
- Dredging and deposit of dredge materials at a new sea deposit site;
- Sea deposit site creation within Uig Bay;
- Extension of marshalling area by land reclamation (11,000m^2) and associated rock armouring;
- Construction of three oil separators and extension of a culvert pipe.

9.63 The ferry terminal development will be carried out either as one continuous delivery programme or as a three-phase project. In this latter case, phase one would consist of "essential upgrades" comprising almost all works below MHWS (including, but not limited to, widening of the approach way, re-fendering of the approach way, widening the berthing structure, installing a new wave wall and dredging with sea deposit of dredge material). Phase two would involve the land reclamation to accommodate the new marshalling area and fisherman's compound and phase three would involve terrestrial works above MHWS.

9.64 If the works are to be carried out as one continuous programme, the expected time to complete the development will be 24 months and if the three-phase programme is selected then 40 working months will be required, with 18 months for phase one, 18 months for phase two and the remaining 4 months for phase three. Both vibratory and impact piling may be used during the works. The simultaneous use of two or more piling rigs will be minimised but remains a possibility.

9.65 Further information can be found here:
Marine Licence - Uig Harbour Redevelopment - Dredging & Sea Disposal - 06910/00009631 | Marine Scotland Information

9.66 Stornoway Harbour Authority - Construction and Capital Dredging - Deep Water Port, Glumaig Bay, Stornoway

Construction of a deep water port at Glumaig Harbour, Stornoway, Isle of Lewis including the following components:

- Construction of the main quay;
- Construction of a heavy load area;
- Construction of a pontoon;
- Construction of a bollard island;
- Construction of the freight ferry berth and linkspan;
- Creation of a levelled area by land reclamation;
- Construction of a link road by land reclamation; and
- Removal of parts of the SS Portugal wreck.

Further information can be found here:
Marine Licence Application - Deep Water Quay construction - Stornoway, Isle Of Lewis - 00008749 | Marine Scotland Information & Marine Licence Application - Dredging and Sea Deposit - Stornoway, Isle Of Lewis - 00008749 | Marine Scotland Information & European Protected Species Licence - Port Development - Stornoway - 00009686 | Marine Scotland Information & Basking Shark Licence - Port Development - Stornoway - 00009871 | Marine Scotland Information

9.67 River Naver Bridge Replacement

9.68 The Naver Bridge Replacement scheme comprises over 450m of new carriageway and a 65m, 3-span bridge, adjacent to the existing bridge over the River Naver, one mile south of Bettyhill.

9.69 The existing bridge is to be demolished following completion of the new structure. The application site spans the River Naver, via the existing A836 Naver Bridge and includes land on both sides of the river.

9.70 Further information can be found here:
Marine Licence Application - Bridge Replacement - Naver Bridge, Bettyhill - 00009688 | Marine Scotland Information

9.71 Moray West Offshore Wind Farm

9.72 The wind farm is located 22.5km southeast off the Caithness coastline. The operational lifespan of the project is expected to be 25 years. The project covers a total area of approximately 225km^2 and will be comprised of no more than 85 wind turbines with a maximum generating capacity of around 850 MW, along with associated offshore transmission infrastructure.

9.73 Further information can be found here:
Moray West Offshore Windfarm | Marine Scotland Information

9.74 Meygen Tidal Turbines

9.75 Construction and operation of a tidal array in the Inner Sound of the Pentland Firth. Phase 1a of the project is complete with four tidal turbines having been installed. A construction timeline for phases 1b and 1c has not yet been determined. Phase 1b of the project involved the deployment of the subsea hub. Four more turbines are to be installed and monitored in Phase 1b. The data collected from these will then be used to inform decisions on the future deployment of the remaining 53 tidal turbines.

9.76 Further information can be found here:

MeyGen Tidal Energy Project | Marine Scotland Information

9.77 00009818/ 00009819 - Forth Ports Ltd (Per RHDHV) - Construction and Dredge and Deposit - Port of Leith Outer Berth

9.78 Expansion and improvement of Outer Berth at Port of Leith.

9.79 More information can be found here:
Marine Licence - Outer Berth Construction - Port of Leith - 00009818 | Marine Scotland Information

9.80 Forth Ports Ltd (Per RHDHV) - Construction and Dredge and Deposit - Port of Leith Outer Berth

9.81 Expansion and improvement of Outer Berth at Port of Leith.

9.82 More information can be found here:
Marine Licence - Outer Berth Construction - Port of Leith - 00009818 | Marine Scotland Information

9.83 Installation of new long sea outfall, Spey Bay

9.84 Construction of a long sea outfall of approximately 1.9km in length to discharge effluent from a distillery into the Moray Firth. The pipe is made of High Density Polyethylene and will be fitted with 2 discharge diffusers, one at the midline and one at the end of the outfall. This will be protected with approximately 300 tonnes of cobbles and 1500 tonnes of boulders. Land based trenching will be conducted in the nearshore intertidal section and the subtidal section will be trenched using marine plant, likely a back-hoe dredger. Material removed during trenching will be stockpiled adjacent to the trench to be used as backfill once the pipe and diffusers are installed. Anti-scour rock mattresses will be used to protect the diffusers. A temporary mooring buoy will be used to attach to the pipes in a storage area until they are required during the construction process. This buoy will be removed at the end of the construction process.

9.85 Further information can be found here:
Marine Licence - Installation of Outfall Pipeline - Spey Bay - 00009953 | Marine Scotland Information

9.86 West Islay Tidal Energy Park

9.87 The construction and operation of a tidal generating station, consisting of between 15 and 30 tidal energy convertors (“TECs”) and associated cabling located on the seabed within the array boundary making landfall at Kintra

onIslay. The generating capacity of each TEC is between 1 and 2 MW. The foundation for each TEC will be (pin) piled to the sea bed.

9.88 Further information can be found here:
West Islay Tidal Energy Park Project | Marine Scotland Information

9.89 Forthwind

9.90 The Development consists of one, WTG, associated infrastructure and electricity export cables approximately 1.5km off the northern shore of the Firth of Forth at Methil, Fife. Construction works have not yet commenced on site.

9.91 Further information can be found here:
Forthwind Offshore Development

9.92 BT R100 Telecommunications Cable Installation – Shetland Region

9.93 BT are undertaking the installation of sixteen armoured fibre optic telecommunications cables in Scottish water, seven of them in the Orkney Marine Region. This forms part of the Scottish Governments Reaching 100 ("R100") broadband project to supply 100% of the Scottish population with superfast broadband. The cable routes have been chosen to be the shortest and most direct routes between the islands meaning the cables will not require optical amplifiers to be installed to ensure the signal gets through. This means that there will be no electromagnetic field ("EMF") emitted by the cables once they are in operation. The project is to install 25-45mm armoured cables with a plough burial method or surface laid and secured with pins and rock armour. Above Mean Low Water Springs ("MLWS") the cable will be buried to a depth of 2m below the surface. Offshore there is a target burial depth of 1m depth to protect and secure the cables. A post lay inspection will take place to allow burial of the cable with rock armour where it has been surface laid. During the landing of the cables at either end an excavator will be utilised to dig the cable trench and pull the cables ashore, utilising excavated material to bury the cables and return the beach profile to its original state.

9.94 Further information can be found here:
Marine Licence - Cable Installation - Eday to Westray - 00009561 | Marine Scotland Information

9.95 Brough Bay Association – 00009604

9.96 Brough Bay Association plan to carry out repairs the top surface of an existing slipway. The uneven surface is making the launching of boats difficult as well as a significant trip hazard. The works will entail breakout of the damaged area of surfacing (approximately 15 x 5m) on the slipway using a vehicle mounted

breaker. The existing fill material will be excavated to rockhead and then backfilled with mass concrete fill in layers dowelled into the masonry slipway walls. A reinforced concrete slab will then be laid over the fill material with dowels into the masonry walls and adjacent slab. Any materials removed from the slipway during the repairs will either be used as aggregate for terrestrial improvement works or will be sent for recycling/disposal. Repairs will be carried out when the tide is below the work level to avoid in-water working. The works will take approximately 3 weeks to complete.

9.97 Further information can be found here:
Marine Licence Application- Slipway Repair - Brough Bay, Caithness- 00009604 | Marine Scotland Information

9.98 Fair Isle Sediment Sampling – 00009623

9.99 Shetland Islands Council propose to undertake a programme of 6 boreholes and 6 vibrocores alongside the marine boreholes to retrieve seabed material samples for geo-environmental testing purposes.

9.100 Further information can be found here:
Marine Licence - Sediment Sampling - New Haven, Fair Isle - 00009623 | Marine Scotland Information

9.101 Montrose Harbour Slipway Repair – 00009748

9.102 Small scale Cementous repair work to void area of slipway.

9.103 Further information can be found here:
Marine Licence - Slipway Repairs - Montrose Harbour - 00009748 | Marine Scotland Information

9.104 SHET – Eastern Green Link 2 (EGL2) – 00009943

9.105 Scottish Hydro Electric Transmission in collaboration with National Grid Electricity Transmission are developing a submarine High Voltage Direct Current (“HVDC”) link between Peterhead in Aberdeenshire and Drax in North Yorkshire, referred to as the Eastern Green Link 2 Project (“EGL2”). EGL2 falls within both Scottish territorial waters within 12 Nautical Miles (“NM”) and in Scottish offshore waters (> 12 NM). From the landfall at Sandford Bay south of Peterhead EGL2’s Installation Corridor heads initially southeast, then broadly south towards the Scottish/English waters border and further in to English territorial waters. 3.2 EGL2 comprises approximately 436km of submarine HVDC cable, comprising 150km in Scottish waters. 3.3 EGL2 is a submarine cable system made up of two HVDC single core metallic

conductors and a fibre optic ("FO") cable, providing 2 Giga Watts of transmission reinforcement.

9.106 Further information can be found here:
Marine Licence Application - SEGL/Eastern Link 2 HVDC Cable and Cable Protection - Peterhead to Drax - 00009943 | Marine Scotland Information

9.107 DIO – Remediation and Construction Works – Dalgety Bay, Fife – 00009986

9.108 The physical works required to address the radium contamination primarily comprise of a robust 'geotextile' membrane of approximately 13,000m^2 held in place and protected by a new revetment consisting of 9,500m^3 of rock armour. The existing Dalgety Bay Sailing Club slipway and jetty structures will also be removed and replaced with a single slipway and jetty structure. The work will involve excavation of the foreshore and will include the removal of 7,500m^3 of beach material to provide foundations for these structures and also to remove contamination at specific areas across the bay. The project will take place over 2 years with works only permitted between April and September.

9.109 Further information can be found here:
Marine Licence - Construction Works, Dalgety Bay Re-Development, Dalgety Bay, Fife - 06906/00009986 | Marine Scotland Information

9.110 Scottish Hydro Electric Transmission ("SHET") - Cable Installation from Shetland to Caithness

9.111 SHET propose to install a 254km high voltage direct current cable between Wesidale Voe in Shetland and Noss Head in Caithness. The whole project including the pre- and post- cable installation surveys, preparatory works and cable installation will take place over a period of approximately three years. SHET have identified a 200m wide installation corridor in which the cable will be installed. Between 238.5km and 250.8km of the cable will be trenched and where burial is not achievable the cable will be protected by rock placement, concrete mattresses or cable protection such as polymer duct or cast-iron half shells depending on which solution is the most suitable based on the location and seabed type. SHET estimates that 3km of seabed features will require pre-sweep or pre-lay rock placement. Objects encountered that are identified as isolated or discarded shall be cleared using an orange peel grab or grapnel respectively.

9.112 Further information can be found here:
Marine Licence - HDVC Link Installation within 12 Nautical Miles - Shetland to Caithness - 07203 | Marine Scotland Information

9.113 SHEPD – Orkney to Hoy North and Central Cable Installations – 00010133

9.114 SHEPD propose to install two new cables and deposit cable protection, for the North and Centre cables between Orkney Mainland and Hoy.

9.115 Further information can be found here:
Marine Licence - Cable Replacement- Orkney to Hoy North and Central-00009469/00010133 | Marine Scotland Information

9.116 SHEPD HVAC cable removal and replacement - Pentland Firth East - 00010145

9.117 Partial removal of existing faulted PFE (2) cable and installation of complete replacement for PFE (2) 33kv distribution submarine electricity cable across the Pentland Firth, landing at Rackwick Bay, Hoy, Orkney Islands and Murkle Bay, Thurso, Highland.

9.118 Further information can be found here:
Marine Licence- Cable Removal and Replacement - Radwick Bay to Muckle Bay - 00010145 | Marine Scotland Information

9.119 Caledonia Export Cable Corridor Geotechnical Surveys – 00010182

9.120 Geotechnical surveys to assess the conditions within the Caledonia Offshore Wind Farm export cable corridor area.

9.121 Further information can be found here:
European Protected Species Licence - Geophysical Survey - Caledonian Offshore Wind Farm Export Cable Corridor - 00010182 | Marine Scotland Information

9.122 MarramWind Offshore Windfarm - Geophysical surveys of export cable corridor – 00010197

9.123 The works involve geophysical surveys of the offshore export cable corridor for MarramWind offshore windfarm. The surveys are scheduled to take place between 1 March 2023 and 30 September 2023, with noise-generating activity occurring for a maximum of 100 days during this period.

9.124 Further information can be found here:
European Protected Species Licence - Geophysical Surveys - MarramWind Offshore Wind Farm Export Cable Corridor - 00010197 | Marine Scotland Information

9.125 Muir Mhòr Offshore Wind Farm - Geophysical Surveys – 00010209

9.126 A geophysical survey campaign between March and July 2023 for the purpose of understanding the bathymetric, geological, and sedimentary characteristics of the seabed and protected features within the Muir Mhòr Offshore Wind Farm array area and projected export cable corridor. The area to be surveyed extends to 229.1km^2 which shall include the wind farm array area together with a 500m buffer zone. The projected export cable corridor at approximately 100km in length and 1000m in width, extending from the wind farm array area to a landfall in the vicinity of Peterhead, will also form part of the survey campaign.

9.127 Further information can be found here:
European Protected Species Licence – Geophysical Surveys – Muir Mhòr Offshore Wind Farm – 00010209 | Marine Scotland Information

9.128 Ayre Offshore Wind Farm (NE2) - Geophysical surveys for array area – 00010227

9.129 The works involve geophysical surveys extending over 419km within the array area of the Ayre Offshore Wind Farm (NE2). The surveys are scheduled to take place between 1 March 2023 and 29 February 2024, with noise-generating activity occurring for a maximum of 52 days during this period.

9.130 Further information can be found here:
European Protected Species Licence - Geophysical Surveys - Thistle Wind Partners Limited (NE2) - 00010227 | Marine Scotland Information

9.131 SHET - Geophysical surveys - Peterhead to Scotland-England Sea border – 00010241

9.132 SHET is developing a submarine High Voltage Direct Current (“HVDC”) link between Peterhead in Aberdeenshire and Drax in North Yorkshire, referred to as the Eastern Green Link 2 Project (“EGL2”). It is necessary to undertake a further geophysical survey of the Project Marine Installation Corridor as there is the potential for UXO, resulting from wartime military operations or more recent military training activities, to be present on the seabed along the cable route. These UXOs present a potentially significant health and safety hazard to cable construction work. Where identified as a hazard, it is necessary to remove confirmed UXO prior to construction (this is activity is not included within this report). The UXO geophysical survey is required for the identification and confirmation of the presence of any UXO hazards prior to installation.

9.133 Further information can be found here:
Basking Shark Licence - Geophysical Survey - Peterhead to Drax - 00010241 | Marine Scotland Information

9.134 Ayre Offshore Wind Farm (NE2) - Geophysical surveys for export cable corridor – 00010299

9.135 Geophysical surveys undertaken between 1 May 2023 and 29 February 2024, with dates yet to be confirmed. Noise-generating activity will last for 41 days.

9.136 Further information can be found here:
European Protected Species Licence – Geophysical Surveys of Export Cable Corridor – Thistle Wind Partners Limited (NE2) - 00010299 | Marine Scotland Information

9.137 Dredging Operations

9.137.1 There are a number of dredging operations which were identified as having a LSE on the North Caithness Cliffs SPA, Moray Firth SAC, Buchan Ness to Collieston SAC, River Dee SAC, River South Esk SAC and River Moriston SAC designated sites which could also be affected by the HWL proposal. Table 16 summarises these projects.

Table 16: Dredging operations identified as having a likely significant effect on the North Caithness Cliffs SPA, Moray Firth SAC, Buchan Ness to Collieston SAC, River Dee SAC, River South Esk SAC and River Moriston SAC designated site also affected by the HWL proposal.

Location of Dredge	Licensee	Amount of Dredge Material	Dredge Spoil Deposit Area	Dates of Licence	Designated Site
Aberdeen Harbour (North and South)	Port of Aberdeen	1,285,500 wet tonnes	Aberdeen (CR110)	1 February 2023 until 31 January 2024	Moray Firth SAC River Dee SAC
Arbroath Harbour	Angus Council	41,280 wet tonnes	Arbroath (FO020)	13 July 2022 until 12 July 2024	Moray Firth SAC
Port of Kirkcaldy	Forth Ports Ltd	63,000 wet tonnes	Kirkcaldy (FO047)	22 December 2021 until 21 December 2024	Moray Firth SAC
Leith Docks and	Forth Ports Ltd	390,000 wet tonnes	Narrow Deep B (FO038)	3 December 2021 until 2	Moray Firth SAC

Approaches				December 2024	
Banff Harbour	Aberdeenshire Council	10,000 wet tonnes	Macduff (CR050)	16 December 2022 until 15 December 2023	Moray Firth SAC
Montrose Harbour	Montrose Port Authority	246,000 wet tonnes	Lunan Bay (FO010) & Montrose Bay Trial Deposit Site	24 September 2022 until 23 September 2023	Moray Firth SAC River South Esk SAC
Buckie Harbour	Moray Council	55,995 wet tonnes	Buckie (CR040)	16 March 2021 until 15 March 2024	Moray Firth SAC
Burghead Harbour	Moray Council	92,400 wet tonnes	Burghead (CR030)	16 March 2021 until 15 March 2024	Moray Firth SAC
River Ness and Approaches	Port of Inverness	13,200 wet tonnes	Inverness (CR027)	1 July 2022 until 30 June 2025	Moray Firth SAC River Moriston SAC
Boddam Harbour	SSE	24,000 wet tonnes	North Buchan Ness (CR080)	1 October 2021 until 30 September 2024	Moray Firth SAC

9.138 Fish farms

9.138.1 There are a number of fish farms which were identified as having a likely significant effect on on Inner Hebrides and the Minches SAC, Fetlar SPA, Hoy SPA, Skule Skerry and Sule Stack SPA, Ailsa Craig SPA, Fair Isle SPA, Noss SPA, Forth Islands SPA and North Rona and Sula Sgeir SPA designated sites which could also be affected by the HWL proposal. Table 17 summarises these projects.

Table 17: Fish farms identified as having a likely significant effect on Inner Hebrides and the Minches SAC, Fetlar SPA, Hoy SPA, Skule Skerry and Sule Stack SPA, Ailsa Craig SPA, Fair Isle SPA, Noss SPA, Forth

Islands SPA and North Rona and Sula Sgeir SPA designated sites also affected by the HWL proposal

Site Name	Licensee	Licensed Equipment	Dates of Licence	Designated Site
Sconser Quarry, Isle of Skye	MOWI Scotland Ltd	7 Ring Cages 1 Feedbarge 3 Boat Moorings 22 Grid Moorings	13 May 2022 until 12 May 2047	Inner Hebrides and the Minches SAC
Maclean's Nose	MOWI Scotland Ltd	16 Ring Cages 1 Feed Barge 26 Grid Moorings 2 Rafts 40 Marked Buoys	10 June 2021 until 9 June 2027	Inner Hebrides and the Minches SAC
Stulaigh Island	MOWI Scotland Ltd	14 ring cages 26 grid moorings 3 boat moorings 1 feed barge	30 September 2019 until 29 August 2024	Inner Hebrides and the Minches SAC
Culnacnoc, Portree	Organic Sea Harvest Ltd	12 ring cages 26 grid moorings 1 feed barge	24 June 2020 until 23 June 2026	Inner Hebrides and the Minches SAC
Scorrybreck, Portree	Organic Sea Harvest Ltd	12 ring cages 26 grid moorings 1 feed barge	20 March 2020 until 19 March 2026	Inner Hebrides and the Minches SAC
Plocrapol, Isle of Harris	The Scottish Salmon Company Ltd	10 ring cages 20 grid moorings 1 feedbarge	11 August 2021 until 16 November 2023	Inner Hebrides and the Minches SAC
East Tarbert Bay	The Scottish Salmon Company Ltd	12 ring cages 22 grid moorings 1 feed barge	21 January 2020 until 19 December 2025	Inner Hebrides and the Minches SAC
Isle of Scalpay	Scalpay Multi-Trophic Aquaculture Ltd	12 ring cages 22 grid moorings 1 feed barge	17 January 2020 until 16 January 2026	Inner Hebrides and the Minches SAC
Wick of Gruting, Fetlar	Cooke Aquaculture Scotland Ltd	12 ring cages 1 feed barge 24 grid moorings	21 April 2020 until 20 April 2026	Fetlar SPA

		4 barge moorings		
Flaeshins, Fetlar	Cooke Aquaculture Scotland Ltd	16 ring cages 1 feed barge 26 grid moorings	3 June 2020 until 2 June 2026	Fetlar SPA
Chalmers Hope, Orkney	Cooke Aquaculture Scotland Ltd	11 ring cages 1 feed barge 24 grid moorings	9 August 2022 until 8 August 2047	Hoy SPA, Skule Skerry and Sule Stack SPA
Shuna Island, Loch Linnhe	Scottish Sea Farms Ltd	8 ring cages 1 feed barge 26 grid moorings 1 boat mooring	2 December 2021 until 1 December 2027	Ailsa Craig SPA
Holms Geo, Shetland	Scottish Sea Farms Ltd	6 ring cages 24 grid moorings 1 feed barge	22 April 2023 until 21 April 2048	Fair Isle SPA and Noss SPA
Setterness North, Shetland	Scottish Sea Farms Ltd	12 ring cages 1 feed barge 20 grid moorings 21 marker buoys	14 April 2023 until 13 April 2048	Fair Isle SPA, Noss SPA and Sule Skerry and Sule Stack SPA
Trilleachan Mor, Loch Seaforth	MOWI Scotland Ltd	5 ring cages 26 grid moorings 2 boat moorings 1 feed barge	26 May 2023 until 25 May 2048	North Rona and Sula Sgeir SPA and Sule Skerry and Sule Stack SPA
Caolas a Deas	MOWI Scotland Ltd	8 ring cages 1 feed barge 36 grid moorings 1 raft	22 March 2023 until 21 March 2048	North Rona and Sula Sgeir SPA and Sule Skerry and Sule Stack SPA
Bringhead, Scapa Flow	Scottish Sea Farms Ltd	12 ring cages 28 grid moorings 2 marked buoys 1 feed barge	21 January 2023 until 21 January 2048	Hoy SPA

9.139 Assessment of in combination effects on the Faray and Holm of Faray SAC, Inner Hebrides and the Minches SAC, Sanday SAC, Moray Firth SAC, River Thurso SAC, River Naver SAC, River Borgie SAC, Berriedale and

Langwell Waters SAC, River Spey SAC, Little Gruinard River SAC, River Oykel SAC, Langavat SAC, North Harris SAC, River Dee SAC, River Moriston SAC, River South Esk SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC, River Bladnoch SAC, Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA, and Ailsa Craig SPA designated sites.

9.139.1 The following projects are included earlier in this section but, if schedules are met, will be completed by the time the HWL proposal construction work begins, preventing the possibility of any in combination effects on the Inner Hebrides and the Minches SAC, Moray Firth SAC, Faray and Holm of Faray SAC, Sanday SAC, River South Esk SAC, River Tay SAC, River Tweed SAC, River Dee SAC, Buchan Ness to Collieston Coast SPA, Caithness and Sutherland Peatlands SPA, Fair Isle SPA, Forth Islands SPA, Hoy SPA, North Caithness Cliffs SPA, Rousay SPA, and the Sumburgh Head SPA:

- Scottish Hydro Electric Power Distribution ("SHEPD") - Geophysical & Geotechnical Surveys - Argyll
- Seagreen Wind Energy Limited - Geophysical Surveys - Seagreen 1A Cable Route
- Scottish Hydro Electric Power Distribution ("SHEPD") - Geophysical Surveys - North Coast and Orkney Islands Marine Region
- North Coast and Orkney Islands Geophysical Surveys - SHEPD
- Fair Isle Sediment Sampling – 00009623
- DIO – Remediation and Construction Works – Dalgety Bay, Fife – 00009986
- SHEPD – Orkney to Hoy North and Central Cable Installations – 00010133
- SHEPD HVAC cable removal and replacement - Pentland Firth East – 00010145
- Highland Council - Ferry Terminal Development - Uig, Isle of Skye
- BT R100 Telecommunications Cable Installation - Orkney Region
- BT R100 Telecommunications Cable Installation – Shetland Region
- MarramWind Offshore Windfarm - Geophysical surveys of export cable corridor – 00010197
- Caledonia Export Cable Corridor Geotechnical Surveys – 00010182
- Muir Mhòr Offshore Wind Farm - Geophysical Surveys – 00010209
- Ayre Offshore Wind Farm (NE2) - Geophysical surveys for export cable corridor – 00010299

- Ayre Offshore Wind Farm (NE2) - Geophysical surveys for array area – 00010227
- Maintenance Dredging – Moray Council – Buckie
- Maintenance Dredging – Moray Council – Burghead
- Maintenance Dredging – Aberdeenshire Council – Banff Harbour
- Maintenance Dredging – Aberdeen Harbour Board – Aberdeen Harbour
- Maintenance Dredging – Montrose Port Authority – Montrose Harbour
- Fish Farm – Scottish Salmon Company – Plocrapol, Isle of Harris
- Global Energy Nigg Ltd – Removal of Two Dolphin Moorings – Nigg Energy Park
- Wellboat Discharge - Various Fish Farms - Inner Hebrides and the Minches SAC

9.139.2 The Inch Cape Offshore Wind Farm, the Forthwind Demonstration Project, and Moray West Offshore Wind Farm projects are currently in the pre-construction/ early construction phase of development, so there is the potential for in combination effect with the HWL proposal if construction is due to take place within the HWL proposal's construction window. However, provided all projects are carried out in accordance with the conditions of the respective AAs, there will be no adverse effect on site integrity of the Moray Firth SAC, River Dee SAC, River South Esk SAC, River Tay SAC, River Teith SAC, River Tweed SAC, Buchan Ness to Collieston Coast SPA, East Caithness Cliffs SPA, Forth Islands SPA, and the Fowlsheugh SPA.

9.139.3 The West Islay Tidal Energy Park has the potential to disturb and or remove the supporting habitat for guillemot species. Although consented, the West Islay Tidal Energy Park is currently not operational. Should construction begin, there is the potential for in combination effect with the HWL proposal if construction is due to take place within the HWL proposal's construction window. Provided both projects are carried out in accordance with the conditions of the respective AAs, there will be no adverse effect on site integrity of the Ailsa Craig SPA, Canna and Sanday SPA and the Rum SPA.

9.139.4 The following projects are included earlier in this section and works may be carried out concurrently with the HWL proposal. However, if conditions in the projects' respective AAs are met then there will be no possibility for in combination effects on the Inner Hebrides and the Minches SAC, Faray and Holm of Faray SAC and Sanday SAC, Moray Firth SAC, River Naver SAC, River Teith SAC, River Moriston SAC, River Dee SAC, Caithness and Sutherland Peatlands SPA, Forth Islands SPA and East Caithness Cliffs SPA:

- UK Marine Renewable Power Ltd - Geophysical Surveys - West Colonsay to North Ayrshire
- Orkney Islands Council (per ITPEnergised) - Extended Slipway and Landing Jetty - Scammalin Bay, Island of Faray
- Ardersier Port Development
- Ferry Terminal Development - Lochmaddy, North Uist

- Stornoway Harbour Authority - Construction and Capital Dredging - Deep Water Port, Glumaig Bay, Stornoway
- River Naver Bridge Replacement
- 00009818/ 00009819 - Forth Ports Ltd (Per RHDHV) - Construction and Dredge and Deposit - Port of Leith Outer Berth
- Installation of new long sea outfall, Spey Bay
- Scottish Hydro Electric Transmission ("SHET") - Cable Installation from Shetland to Caithness
- BEAR Scotland - Bridge Maintenance Works - Kessock Bridge, Inverness-shire
- SHET – Eastern Green Link 2 (EGL2) – 00009943
- Maintenance Dredging – SSE – Boddam Harbour
- Maintenance Dredging – Angus Council – Arbroath Harbour
- Maintenance Dredging – Port of Inverness – River Ness and Approaches

9.139.5 The following projects may be active during the construction phase of the HWL proposal and have had AAs carried out, but these AAs did not result in conditions to ensure no adverse effects on site integrity:

- Flex Marine Power Ltd – Tidal Turbine and Associated Infrastructure
- SHET - Geophysical surveys - Peterhead to Scotland-England Sea border – 00010241
- Maintenance Dredging – Forth Ports – Leith Docks and Approaches
- Maintenance Dredging – Forth Ports – Port of Kirkcaldy
- Fish Farm – MOWI Scotland – Stulaigh Island
- Fish Farm – Scalpay Multi-Trophic Aquaculture Ltd – Isle of Scalpay
- Fish Farm – Organic Sea Harvest – Scorrybreck, Portree
- Fish Farm – The Scottish Salmon Company – East Tarbert Bay
- Fish Farm – Organic Sea Harvest – Culnacnoc, Portree
- Fish Farm – MOWI Scotland – Maclean’s Nose
- Fish Farm – Cooke Aquaculture Scotland Ltd - Flaeshins, Fetlar
- Fish Farm – Scottish Sea Farms Ltd – Shuna Island, Loch Linnhe
- Fish Farm – Scottish Sea Farms Ltd – Setterness North, Shetland
- Fish Farm – MOWI Scotland Ltd – Trilleachan Mor, Loch Seaforth
- Fish Farm – MOWI Scotland Ltd – Caolas a Deas

9.139.6 The following projects may be active during the construction phase of the HWL proposal and have had AAs carried out. Provided all the projects are undertaken in line with the conditions in their respective AA’s, MD-LOT concludes that any in combination effects will not adversely affect the site integrity of the Moray Firth SAC, River Teith SAC, Fetlar SPA, Forth Islands SPA, Fair Isle SPA, Hoy SPA, North Caithness Cliffs SPA, Noss SPA and the Skule Skerry and Sule Stack SPA

- Forth Ports Ltd (Per RHDHV) - Construction and Dredge and Deposit - Port of Leith Outer Berth
- Brough Bay Association – 00009604
- Fish Farm – Cooke Aquaculture Scotland Ltd – Wick of Gruting, Fetlar
- Fish Farm – Cooke Aquaculture Scotland Ltd – Chalmers Hope, Orkney
- Fish Farm – Scottish Sea Farms Ltd – Holms Geo, Shetland
- Fish Farm – Scottish Sea Farms Ltd – Bringhead, Scapa Flow

10 MD-LOT Conclusion

10.1 MD-LOT concludes that there will be no adverse effect on the site integrity of the Faray and Holm of Faray SAC, Inner Hebrides and the Minches SAC, Sanday SAC, Moray Firth SAC, River Thurso SAC, River Naver SAC, River Borgie SAC, Berriedale and Langwell Waters SAC, River Spey SAC, Little Gruinard River SAC, River Oykel SAC, Langavat SAC, North Harris SAC, River Dee SAC, River Moriston SAC, River South Esk SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC and River Bladnoch SAC, Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA, and Ailsa Craig SPA from the HWL proposal either in isolation or in combination with other plans or projects for a 30 year operational period.

10.2 MD-LOT concludes that there will be no adverse effect on the site integrity of the North Caithness Cliffs SPA with respect to the kittiwake and puffin qualifying interests from the HWL proposal for a 10 year operational period either in isolation or in combination with other plans or projects. The most up to date and best scientific advice available has been used in reaching the conclusion that the HWL proposal will not adversely affect the integrity of the above sites, and MS-LOT is satisfied that no reasonable scientific doubt remains.

10.3 In reaching its conclusions, MD-LOT has given considerable weight to NatureScot advice. The methods advised by NatureScot through scoping and additional information requested by NatureScot have been fully incorporated into this assessment. As such, divergence from NatureScot advice is limited to differing conclusions in relation to site integrity for kittiwake at puffin at North Caithness Cliffs SPA. In reaching a different conclusion, MD-LOT consider that the level of impact being adverse to site integrity is a subjective opinion after considering the data assumptions. In reaching its own conclusions, MD-LOT has taken account of the entire context of this assessment, in particular some its precautionary assumptions, which make it unlikely the number of impacted

individuals will be as large as the values presented in the assessment. For these reasons, MD-LOT consider the levels of assessed impact to be reasonable and are convinced there will be no adverse impacts on site integrity of the North Caithness Cliffs SPA.

SECTION 4: CONDITIONS

11 Requirement for conditions

11.1 The following conditions are required to ensure the HWL proposal will not adversely affect the site integrity of the Faray and Holm of Faray SAC, Inner Hebrides and the Minches SAC, Sanday SAC, Moray Firth SAC, River Thurso SAC, River Naver SAC, River Borgie SAC, Berriedale and Langwell Waters SAC, River Spey SAC, Little Gruinard River SAC, River Oykel SAC, Langavat SAC, North Harris SAC, River Dee SAC, River Moriston SAC, River South Esk SAC, River Tay SAC, River Tweed SAC, River Teith SAC, Endrick Water SAC, River Bladnoch SAC, North Caithness Cliffs SPA, Caithness and Sutherland Peatlands SPA, Hoy SPA, Cape Wrath SPA, Sule Skerry and Sule Stack SPA, Marwick Head SPA, East Caithness Cliffs SPA, Copinsay SPA, Rousay SPA, West Westray SPA, Auskerry SPA, Handa SPA, Calf of Eday SPA, Priest Island SPA, North Rona and Sula Sgeir SPA, Fair Isle SPA, Troup, Pennan and Lion's Heads SPA, Foula SPA, Buchan Ness to Collieston Coast SPA, Sumburgh Head SPA, Mousa SPA, Flannan Isles SPA, Noss SPA, Ramna Stacks and Gruney SPA, Fowlsheugh SPA, Canna and Sanday SPA, Rum SPA, Fetlar SPA, Hermaness, Saxa Vord and Valla Field SPA, St. Kilda SPA, Mingulay and Berberay SPA, Forth Islands SPA, and Ailsa Craig SPA:

1. Duration of the Consent

The consent is valid from the date of this consent until 10 years from the date of Final Commissioning of the Development. Written confirmation of the date of Final Commissioning of the Development must be provided by the Company to the Scottish Ministers and to the Highland Council no later than one calendar month after this date.

2. Piling Strategy

If piling is to be undertaken, the Company must, no later than six months prior to the Commencement of the Development, submit a Piling Strategy ("PS"), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with NatureScot and any such other advisors as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The PS must include, but not be limited to:

a) Details of expected noise levels from pile-drilling/driving in order to inform point d) below;

b) Full details of the proposed method and anticipated duration of piling to be carried out at all locations;
c) Details of soft-start piling procedures and anticipated maximum piling energy required at each pile location; and
d) Details of any mitigation such as Passive Acoustic Monitoring ("PAM"), Marine Mammal Observers ("MMO"), use of Acoustic Deterrent Devices ("ADD") and monitoring to be employed during pile-driving, as agreed by the Scottish Ministers.

The PS must be in accordance with the Application and must also reflect any relevant monitoring or data collection carried out after submission of the Application. The PS must demonstrate the means by which the exposure to and/or the effects of underwater noise have been mitigated in respect to cetaceans, harbour seal, grey seal and Atlantic salmon. The PS must, so far as is reasonably practicable, be consistent with the Environmental Management Plan ("EMP"), the Project Environmental Monitoring Programme ("PEMP") and the Construction Method Statement ("CMS").

Reason: *To mitigate the underwater noise impacts arising from piling activity*.

SECTION 5: REFERENCES

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