

# **Fanellan Hub 400 kV Substation and Converter Station**

## **Environmental Impact Assessment Report**

### **Volume 4 | Technical Appendices**

#### **Appendix 10.1 – Ornithology Baseline**

**February 2025**



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## 1. INTRODUCTION

### 1.1 Background

- 1.1.1 Scottish and Southern Electricity Networks Transmission (hereafter referred to as 'SSEN Transmission'), operating under licence as Scottish Hydro Electric Transmission plc (SHE Transmission plc) is proposing to submit an application for full planning permission under the Town and Country Planning (Scotland) Act 1997<sup>1</sup> (as amended) for consent to construct a new 400 kV substation and a new High Voltage Direct Current (HVDC) converter station (the 'Proposed Development') at Fanellan near Beauly, Inverness. The Proposed Development boundary is illustrated on **Figures 10.1.2 Breeding Bird Survey Results 2023 and 10.1.3 Flight Activity Survey Results 2023**.
- 1.1.2 WSP was commissioned to undertake a breeding bird survey programme to inform the assessment of potential impacts from the Proposed Development. This report details the methods and results of those surveys and the results of surveys from associated developments with overlapping survey areas. Assessment of potential impacts to the species forming the ornithology baseline and subsequent recommendations to ensure no significant residual effects, if appropriate, are detailed in **Chapter 10: Ornithology** of the Environmental Impact Assessment Report and a Non-Confidential Summary.

### 1.2 Confidential Records

- 1.2.1 The Ornithology Baseline Appendix contains a high-level summary of the breeding status for Schedule 1 raptor species relative to the Proposed Developments Ecological Zone of Influence (EZoI). Full details of nest site locations and an assessment of potential impacts from the Proposed Development are provided in **Volume 5, Confidential Appendix 10.2**. The confidential chapter and its accompanying **Figure 10.2.1** are not for public viewing and should only be viewed by persons for whom the information is essential to progress or assess the Proposed Development.

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<sup>1</sup> Town and Country Planning (Scotland Act) 1997. Available at: <https://www.legislation.gov.uk/ukpga/1997/8/contents> [Accessed: June 2024].

## 2. METHODS

### 2.1 Desk Study

- 2.1.1 A desk-based study to identify designated sites within and surrounding the Proposed Development was undertaken during the site selection stage. The following statutory designated sites at European or International level with ornithological interests were identified within a provisional search area of 10 km beyond the Proposed Development site boundary. The search was extended to 20 km to account for the increased foraging range of certain bird of prey species (osprey *Pandion haliaetus*) and goose species (greylag goose *Anser anser* and pink-footed goose *Anser brachyrhynchus*). Cromarty Firth SPA and Ramsar was the only site within the extended 20km search area (15.1km north-east) to be designated for osprey *Pandion haliaetus*. All designated sites are detailed in **Section 3.1** and illustrated on **Figure 10.1.1**.
- 2.1.2 There are no statutory designated sites at National or Local level within 2km of the Proposed Development site. There are no non-statutory designations or nature conservation sites which overlap with the Proposed Development site or are otherwise connected.
- 2.1.3 Additional ornithology baseline data is available from three proposed projects with overlapping survey areas:
- Scarce Breeding Bird Surveys (SBBS) for the proposed Beaully to Peterhead 400kV OHL (2023);
  - SBBS for the proposed Spittal – Loch Buidhe – Beaully 400kv OHL (2024); and
  - Flight activity surveys from a single Vantage Point within the Site overlooking the Proposed Beaully Denny OHL diversion which will tie into the Proposed Development (2023).
- 2.1.4 Studies of the distribution of foraging geese from relevant designated sites were used to predict if important foraging assemblages could occur within an Ecological Zone of Influence (EZOI) of the Proposed Development<sup>2</sup>. The EZOI was based on the predicted maximum disturbance/displacement distance relating to pink-footed goose *Anser brachyrhynchus*. Mitchell (2012)<sup>3</sup> provides data on the distribution of pink-footed *Anser brachyrhynchus* and greylag geese *Anser anser* within 20 km of all relevant European sites.

### 2.2 Breeding Bird Survey

- 2.2.1 Breeding bird surveys were undertaken across the Proposed Development plus an additional 100 m from the Proposed Development (the 'Breeding Bird Survey Area'). The survey was undertaken over four survey visits (at least two weeks apart) encompassing the period early-April to early July 2023 (inclusive). The survey methodology followed an adapted version of the British Trust for Ornithology (BTO) Common Bird Census (CBC)<sup>4</sup> whereby the number of visits was reduced from ten to four. Four survey visits are considered sufficient

2 Goodship, N.M. and Furness, R.W. (MacArthur Green) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283. <https://www.nature.scot/doc/naturescot-research-report-1283-disturbance-distances-review-updated-literature-review-disturbance#Black-throated+diver,+Gavia+arctica>

3 Mitchell, C. (2012). Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. 108pp.

4 Marchant, J.H (1983). Common Birds Census Instructions. BTO, Tring.

to inform on the breeding bird assemblage and four visits are recommended for breeding bird surveys by NatureScot<sup>5</sup>.

- 2.2.2 During the survey, the surveyor walked the Breeding Bird Survey Area so that all areas of habitat, particularly field boundaries, were approached within 50 m. Observations of birds were recorded on survey maps using BTO species and behavioural codes.

## 2.3 Breeding Bird Territory Analysis

- 2.3.1 The objective of the breeding bird surveys was to identify the presence and locations of breeding territories held by species of conservation concern. Such species are referred to as 'target species' and were based on the following legislative or conservation lists:

- Annex I of the EU Directive on the Conservation of Wild Birds 79/409/EEC (the 'Birds Directive') (Annex I);
- Schedule 1 (including Schedule 1A and/or A1) of the Wildlife and Countryside Act (1981) (Schedule 1);
- 'Red' or 'Amber' on BoCC<sup>6</sup>; and
- Scottish Biodiversity List (SBL)<sup>7</sup>.

- 2.3.2 Breeding bird survey records were entered into ArcMap Geographical Information System (GIS) software. These were then analysed to identify the minimum number of probable or confirmed breeding territories for all target species recorded. This was done following the CBC methods. This either involves the identification of clusters of registrations of birds of the same species displaying breeding characteristics (e.g., singing, alarm calling, nest building, mating) or food provisioning in the same general area over successive survey visits (probable breeding), or the discovery of an active nest (e.g., containing eggs or chicks) (confirmed breeding). Given that the surveys comprised four visits over the breeding season, the minimum requirement for a cluster, and hence a probable breeding territory, to be defined was at least two registrations conforming to the above criteria recorded on separate survey visits conducted at least ten days apart.

- 2.3.3 Non-target species (e.g., listed as 'Green' on BoCC) were identified as being present within the Breeding Bird Survey Area but territory analysis was not conducted on these species due to their lower conservation value and the low likelihood of significant effects from the Proposed Development on those species.

## 2.4 Assumptions and Limitations

- 2.4.1 The breeding bird survey represents an adapted version of the CBC methodology with fewer survey visits undertaken. Four survey visits are considered sufficient to provide an estimate of breeding territories to enable an assessment of effects of the Proposed Development to be undertaken. The number and location of breeding territories is an estimate based on the species and behaviours recorded.
- 2.4.2 After completion of the Breeding Bird Surveys, the Proposed Site Development Boundary was increased to encompass a larger area of land. The additional area includes exclusion zones (where no works will take place) and topsoil storage areas which is situated on agricultural grazing pasture and therefore considered to be of low ornithological value. A small area of riparian woodland within the site of the associated development

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<sup>5</sup> SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms

<sup>6</sup> Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I (2021). Birds of Conservation Concern 5: The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114, 723-747.

<sup>7</sup> The Scottish Biodiversity List is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. For the complete list please visit: <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list>.

involving modifications to the Black Bridge over the River Beaully may represent a higher value area of habitat not covered by the Breeding Bird Survey effort. However, this is not considered a significant limitation. Professional judgement has been used to predict the likely breeding bird assemblage to inform recommendations for appropriate mitigation which is discussed further in **Chapter 10 Ornithology of the Environmental Impact Assessment Report**.

- 2.4.3 A Scarce Breeding Bird Survey overlapping the expanded Proposed Site Development Boundary and 2km study area was conducted for the proposed Beaully-Peterhead 400kV OHL in 2023 and for the proposed Spittal – Loch Buidhe – Beaully 400kv OHL in 2024 with data collected relating to sensitive breeding species (Schedule 1 raptors). Additionally, flight activity surveys were conducted from a single Vantage Point (VP) within the Proposed Development for the associated proposed Beaully Denny OHL diversion. A summary of the findings from these related surveys is detailed within **Section 3.3** and **Section 3.4** of this report.
- 2.4.4 Bird survey data is typically valid if collected within the last five years or within three years if the populations of key species are known to be changing rapidly, for example, if conditions are likely to change more quickly due to ecological processes or anticipated changes in management.

### 3. SURVEY RESULTS

#### 3.1 Desk Study

3.1.1 The following statutory designated sites at European or International level with ornithological interests were identified within the search area:

- Inner Moray Firth Special Protection Area (SPA) and Ramsar (4.4 km north-east) – designated for breeding osprey *Pandion haliaetus* and common tern *Sterna hirundo*, and non-breeding/overwintering greylag goose *Anser anser*, goldeneye *Bucephala clangula*, greater scaup *Aythya marila*, teal *Anas crecca*, wigeon *Mareca penelope*, goosander, red-breasted merganser *Mergus merganser*, bar-tailed godwit *Limosa lapponica*, redshank *Tringa totanus*, curlew *Numenius arquata*, oystercatcher *Haematopus ostralegus*, cormorant *Phalacrocorax carbo*, and waterfowl assemblage.
- Moray Firth SPA (6.1 km north-east) – designated for non-breeding common scoter, eider, goldeneye *Bucephala clangula*, great northern diver *Gavia immer*, long-tailed duck *Clangula hyemalis*, red-breasted merganser *Mergus merganser*, red-throated diver *Gavia stellata*, scaup *Aythya marila*, shag *Gulosus aristotelis*, Slavonian grebe *Podiceps auritus*, and velvet scoter *Melanitta fusca*.
- Glen Affric to Strathconon SPA (9.1 km west) – designated for breeding golden eagle *Aquila chrysaetos*.
- North Inverness Lochs SPA (9.4 km south) – designated for breeding Slavonian grebe *Podiceps auritus*.
- Cromarty Firth SPA and Ramsar (15.1 km north-east) – designated for breeding osprey *Pandion haliaetus* and common tern *Sterna hirundo*, and non-breeding/overwintering whooper swan *Cygnus cygnus*, greylag goose *Anser anser*, pintail *Anas acuta*, wigeon *Mareca penelope*, greater scaup *Aythya marila*, red-breasted merganser *Mergus merganser*, bar-tailed godwit *Limosa lapponica*, dunlin *Calidris alpina*, knot *Calidris canutus*, curlew *Numenius arquata*, redshank *Tringa totanus*, oystercatcher *Haematopus ostralegus*, and waterfowl assemblage.

3.1.2 There are no statutory designated sites at National or Local level within 2km of the Proposed Development site. There are no non-statutory designations or nature conservation sites which overlap with the Proposed Development site or are otherwise connected.

3.1.3 The distribution maps in Mitchell (2012) for foraging geese within 20 km of the Inner Moray Firth SPA/Ramsar and Cromarty Firth SPA/Ramsar show no indication that the Proposed Development Site is within an important foraging area for geese from the European sites. More dense clusters of foraging activity are indicated to the north-east of the Proposed Development.

#### 3.2 Breeding Bird Survey

3.2.1 A total of 22 bird species were recorded between April and July 2023, inclusive of two Schedule 1 and/or Annex I listed species. Four species (red kite *Milvus milvus*, crossbill *Loxia curvirostra*, house martin *Delichon urbicum* and swallow *Hirundo rustica*) were only recorded in flight across the Breeding Bird Survey Area. A summary of the results for all target species recorded is provided below in Error! Reference source not found.. The distribution of those target species exhibiting territorial behaviour, as defined above in Section 2.3, is illustrated

in **Figure 10.1.2 Breeding Bird Survey Results**. Target species not confirmed as holding territory are not illustrated on Figure 10.1.1.

**Table 1 Breeding Bird Survey Results – All species**

Species	Scientific name	Count	Annex I	Schedule 1	BoCC <sup>8</sup>	SBL <sup>9</sup>
Lapwing	<i>Vanellus vanellus</i>	1 T	-	-	Red	Yes
Skylark	<i>Alauda arvensis</i>	3 T	-	-	Red	Yes
House martin	<i>Delichon urbicum</i>	1 F	-	-	Red	-
Starling	<i>Sturnus vulgaris</i>	15 I	-	-	Red	Yes
Mistle thrush	<i>Turdus viscivorus</i>	12 I	-	-	Red	-
Tree sparrow	<i>Passer montanus</i>	1 I	-	-	Red	Yes
House sparrow	<i>Passer domesticus</i>	19 I	-	-	Red	Yes
Linnet	<i>Linaria cannabina</i>	5 I	-	-	Red	Yes
Yellowhammer	<i>Emberiza citrinella</i>	3 T	-	-	Red	Yes
Oystercatcher	<i>Haematopus ostralegus</i>	3 I	-	-	Amber	-
Common gull	<i>Larus canus</i>	8 I	-	-	Amber*	-
Rook	<i>Corvus frugilegus</i>	44 I	-	-	Amber	-
Willow warbler	<i>Phylloscopus trochilus</i>	5 I	-	-	Amber	-
Whitethroat	<i>Curruca communis</i>	1 I	-	-	Amber	-
Wren	<i>Troglodytes troglodytes</i>	2 I	-	-	Amber	-
Song thrush	<i>Turdus philomelos</i>	1 T	-	-	Amber	Yes
Dunnock	<i>Prunella modularis</i>	1 I	-	-	Amber	-
Meadow pipit	<i>Anthus pratensis</i>	12 I	-	-	Amber	-
Bullfinch	<i>Pyrrhula pyrrhula</i>	5 I	-	-	Amber	Yes
Red Kite	<i>Milvus milvus</i>	1 F	Yes	Yes	Green	Yes
Barn swallow	<i>Hirundo rustica</i>	1 F	-	-	Green	-
Common crossbill	<i>Loxia curvirostra</i>	2 F	-	Yes	Green	-
Key to Count Codes. T: Number of estimated territories I: Number of individuals. F: Number of individuals seen in flight only						
* Denotes a species that is BoCC listed due to wintering/non-breeding importance only						

### 3.3 Flight activity survey

Flight activity surveys were conducted between April 2023 and August 2023 for the proposed Beaully Denny OHL diversion, the survey area of which overlapped the Proposed Site Development Boundary land area and

<sup>8</sup> Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I (2021). Birds of Conservation Concern 5: The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114, 723-747.

<sup>9</sup> The Scottish Biodiversity List is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. For the complete list please visit: <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list>.



2km study area. Seven species were recorded across a total of 56 flights: greylag goose *Anser anser* (SPA qualifying - one flight); oystercatcher *Haematopus ostralegus* (one flight); lapwing *Vanellus vanellus* (five flights); herring gull *Larus argentatus* (three flights); osprey *Pandion haliaetus* (18 flights); honey-buzzard *Pernis apivorus* (Schedule 1 listed - two flights); and red kite *Milvus milvus* (26 flights). Flights are illustrated in **Figure 10.1.3**.

### 3.4 Scarce Breeding Bird Survey

- 3.4.1 Scarce Breeding Bird Surveys were conducted for the proposed Beauly-Peterhead OHL (2023) and proposed Spittal – Loch Buidhe – Beauly 400kv OHL (2024), the survey areas of which overlapped the updated Proposed Development footprint and a 2km study area. The surveys targeted sensitive breeding Schedule 1 raptors, of which three species were confirmed as nesting: osprey *Pandion haliaetus* (SPA qualifying - two nest sites in 2023, two nest sites in 2024); red kite *Milvus milvus* (one nest site in 2023, one nest site in 2024); and peregrine *Falco peregrinus* (one nest site in 2023). These results are discussed in further detail in **Chapter 10 Ornithology of the Environmental Impact Assessment Report** and illustrated in **Confidential Figure 10.1** accompanying Chapter 10.
- 3.4.2 In addition, there were flight observations of the Schedule 1 species honey-buzzard *Pernis apivorus* within the study area during surveys for the proposed Beauly-Peterhead OHL. Although breeding was not confirmed, flight activity from this species indicated a territory was established within the wider area surrounding the Proposed Development. This activity involved three observations of the same individual on a single date in June 2023. One of the flights involved 'wing clapping' display indicative of territorial behaviour.

## 4. CONCLUSIONS

- 4.1.1 The assemblage of breeding birds recorded within the Study Area during Breeding Bird Surveys is typical of a woodland and agricultural habitat mosaic. Four species of elevated conservation concern (red-listed BoCC5, SBL) were found to be holding breeding territories within the Proposed Development: lapwing *Vanellus vanellus*, song thrush *Turdus philomelos*, skylark *Alauda arvensis*, and yellowhammer *Emberiza citrinella*. An additional six red-listed species were recorded foraging within or over the Proposed Development: house martin *Delichon urbicum*, starling *Sturnus vulgaris*, mistle thrush *Turdus viscivorus*, tree sparrow *Passer montanus*, house sparrow *Passer domesticus*, and linnet *Linaria cannabina*. A single commuting flight for common crossbill *Loxia curvirostra* (Schedule 1 species) was recorded.
- 4.1.2 Red kite *Milvus milvus* were also recorded during Breeding Bird Surveys, though in flight only and with nest sites located outside of the Proposed Site Development Boundary. Sensitive breeding Schedule 1 raptors confirmed as breeding within 2km of the Proposed Development from overlapping scheme survey data include osprey *Pandion haliaetus*, red kite *Milvus milvus* and peregrine *Falco peregrinus*. Flights of these raptors across the Proposed Development area during the Flight Activity surveys were likely to include those birds holding breeding territories within the wider area. The large foraging range of up to 20km<sup>10</sup> for osprey *Pandion haliaetus* means there is a potential link with qualifying populations of the Inner Moray and Firth SPA and Ramsar and Cromarty Firth SPA and Ramsar and birds breeding within 2km of the Proposed Development.
- 4.1.3 Geese species were recorded on only one occasion during the proposed Beaulay-Peterhead OHL scheme with overlapping study areas. A flock of eight greylag geese *Anser anser* was recorded in flight only during the flight activity surveys and not seen to land, with no indication of the Proposed Site Development area being utilised as a foraging area by greylag goose *Anser anser* or other geese species.

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<sup>10</sup> Scottish Natural Heritage. 2016. *Assessing Connectivity with Special Protection Areas (SPAs)*. Available from: <https://www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf> Accessed 29 July 2024.