Scottish & Southern Electricity Networks

TRANSMISSION

Dunoon to Loch Long 132 kV OHL Rebuild

Environmental Impact Assessment

Volume 4 | Technical Appendix 8.1

Ornithology Baseline Report

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LIST OF ABBREVIATIONS

ARSG	Argyll Raptor Study Group
BoCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
CIEEM	Chartered Institute of Ecology and Environmental Management
CRA	Collison Risk Area
CSBGCSG	Central Scotland Black Grouse & Capercaillie Study Group
EIA	Environmental Impact Assessment
EU	European Union
FLS	Forestry and Land Scotland
GET	Golden Eagle Topography
LBAP	Local Biodiversity Action Plan
LNCS	Local Nature Conservation Site
LNR	Local Nature Reserve
LoD	Limit of Deviation
OIA	Ornithological Impact Assessment
OHL	Overhead Line
PAT	Predicted Aquila Territories
PRC	Potential Risk of Collision
RSPB	Royal Society for the Protection of Birds
SBL	Scottish Biodiversity List
SNH	Scottish Natural Heritage (now NatureScot)
SPA	Special Protection Area
SPI	Standardised Preference Index
SSEN	Scottish and Southern Electricity Networks Transmission
SSSI	Site of Special Scientific Interest
VP	Vantage Point

EXECUTIVE SUMMARY

An ornithology desk study and suite of ornithology surveys were undertaken to provide the baseline on which to inform the Ornithological Impact Assessment (OIA) for the proposed replacement of the twin circuit 132 kV steel lattice overhead line (OHL), between the existing Dunoon Substation and existing Tower 15 (the Proposed Development). The site of the Proposed Development comprises a 50 m Limit of Deviation (LoD) from the alignment of the proposed overhead line (the proposed OHL alignment) and land encompassing all access routes and construction areas (the Site).

The desk study comprised a search for designated sites of nature conservation interest within a maximum of 20 km from the Site and ornithology data requests within a maximum of 6 km of the Site. A suite of ornithology surveys was undertaken from December 2020 to August 2021, comprising the following: flight activity surveys (covering the non-breeding season and breeding season), moorland breeding bird surveys, scarce breeding bird surveys, lekking black grouse surveys and winter walkover surveys. All flights recorded during the flight activity surveys at between 10 m and 50 m height above ground level that crossed the LoD plus 50 m either side of the LoD (termed the Collison Risk Area (CRA)), were determined to be at Potential Risk of Collision (PRC).

Surveys were undertaken across an area encompassing a maximum of 2 km from a preferred route as identified during the route selection stage of the project. The preferred route encompassed all potential alignments for the proposed OHL alignment under consideration at the time. Target Species for the ornithology surveys were selected based on their conservation status, such as presence on Schedule 1 of the Wildlife and Countryside Act 1981, Annex I of the Birds Directive or due to their vulnerability to impacts from OHL developments.

The Site is situated across upland habitats comprising commercial forestry and open moorland bisected by two glens with coastal areas of Loch Long and the Firth of Clyde to the east. Two designated sites with ornithological interest features were identified approximately 790 m east of the Site, namely the Holy Loch Local Nature Reserve (LNR) and Local Nature Conservation Site (LNCS). These sites cover overlapping areas and are notable for estuarine habitats that support wintering bird assemblages. Ornithology records gathered during the desk study included breeding sites of golden eagle, hen harrier and barn owl and records of lekking black grouse.

A summary of the ornithology survey results is provided below:

- non-breeding season flight activity surveys – eleven flights by five Target Species; six flights by golden eagle, two by black grouse and one each by hen harrier, peregrine falcon and golden plover. One flight each by golden eagle and black grouse were recorded at PRC;
- breeding season flight activity surveys – 15 flights by three Target Species; eleven flights by hen harrier, three by golden eagle and one by red kite. Two flights by golden eagle and two by hen harrier were recorded at PRC;
- moorland breeding bird surveys – two territories of common sandpiper were recorded;
- scarce breeding bird surveys – no breeding territories of scarce breeding birds were identified. This included visiting the location of desk study records provided within the survey area;
- lekking black grouse surveys – two leks, each comprising single males were recorded with additional lekking records obtained from the other surveys; and
- winter walkover surveys – eight Target Species were recorded including two records of golden eagle, four records of red grouse and three records of snipe from the open upland areas. Additionally records of redshank, curlew and oystercatcher were recorded from the coastal areas of the survey area.

1. INTRODUCTION

1.1 Background

1.1.1 WSP UK Ltd was commissioned by Scottish and Southern Electricity Networks Transmission (hereafter referred to as 'SSEN Transmission') to compile baseline ornithology information for the proposed replacement of the twin circuit 132 kV steel lattice OHL, between the existing Dunoon Substation and existing Tower 15 (the Proposed Development).

1.1.2 This Ornithology Baseline Report (this 'Report') details the breeding locations of specially protected birds (listed under Schedule 1 of the Wildlife and Countryside Act 1981) that are potentially vulnerable to persecution. As a result, detailed locational information on such species is included in a Confidential Annex (**Annex 3**). This information should not be released into the public domain with distribution restricted to the minimal number of persons/ bodies required to administer and assess the application.

1.2 Scope of Report

1.2.1 A desk study and ornithology surveys (the 'Ornithology Study') were undertaken across an area encompassing the initial preferred route for the Proposed Development (the Preferred Route) plus appropriate survey/ search buffers, extending to a maximum of 6 km from the Route Corridor. The Ornithology Study focused on the Route Corridor as it commenced in September 2020, prior to the selection of the proposed alignment for the Proposed Development (the 'proposed OHL alignment'). The proposed OHL alignment in relation to the Route Corridor and ornithology survey areas is shown in **Annex 2 - Figure 8.1.1**.

1.2.2 The proposed OHL alignment was finalised in October 2022, following the completion of ornithology surveys in August 2021. The Route Corridor encompasses all sections of the proposed OHL alignment with the exception of the northern section, to the south and east of Am Binnein, where the proposed OHL alignment deviates to the south-east through woodland. Implications of this in relation to the ornithology baseline are discussed within this Report.

1.2.3 For the purposes of this Report the ornithology baseline is described in relation to the proposed OHL alignment and/ or the total area of land required to construct the Proposed Development (the Site). The Site of the Proposed Development comprises the Limit of Deviation (LoD) of the proposed OHL alignment (a 100 m corridor centred on the proposed OHL alignment) (hereafter the 'LoD') and all applicable temporary and permanent construction areas and access tracks (including indicative helicopter flight paths[1]) (**Annex 2 – Figure 8.1.1**).

1.2.4 This Report provides details of the methods and results of the Ornithology Study conducted to inform the Ornithological Impact Assessment (OIA) for the Proposed Development. The Report concentrates on Target Species recorded in and around the Site which fall into at least one of the following categories:

- Birds listed on Annex I of the EU Birds Directive (Annex I)[2];
- Birds listed on Schedule 1of the Wildlife and Countryside Act 1981 (as amended) (Sch1)[3];
- Species that are qualifying features of international or European designated sites of nature conservation importance for birds (i.e. Special Protection Areas (SPAs) and Wetlands of International Importance (Ramsar Sites)) in proximity or potentially connected to the Site;

[1] Helicopter flights required to deliver Tower sections and string conductors

[2] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Codified version). Available online at : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147 (Accessed November 2021).

[3] Schedule 1-listed species of the Wildlife and Countryside Act 1981. Available online at: http://www.legislation.gov.uk/ukpga/1981/69/schedule/1 (Accessed June 2022).

- Species listed on the Scottish Biodiversity List (SBL)[4];
- Red-listed Birds of Conservation Concern (BoCC) (Stanbury et al., 2021)[5]; and
- Bird species selected for action under the Argyll and Bute Biodiversity Action Plan 2010 -2015 (Draft) (Local Biodiversity Action Plan (LBAP)[6].

1.2.5 Other species which are typically recognised as being potentially vulnerable to the effects of OHL developments, but which do not fall under any of the above categories, such as certain wader and waterfowl species, were also recorded as Target Species. Passerines, regardless of conservation status, were not considered in detail as they are not considered to be vulnerable to impacts from OHL developments[7].

1.2.6 The conservation status of all species recorded to inform this Report is provided in **Annex 1**, together with scientific names. As a result, scientific names are not provided in the text unless not recorded during the desk study or during surveys.

[4] NatureScot (2022). Scottish Biodiversity List. Available online at: https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list (Accessed 2 June 2022).

[5] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). 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

[6] Argyll and Bute Council (undated). The Argyll and Bute Local Biodiversity Action Plan 2010 – 2015. Available online: https://www.argyll-bute.gov.uk/sites/default/files/Unknown/AandB%20BAP%20Draft.pdf. (Accessed June 2022).

[7] SNH (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds – Guidance (version 1).

2. METHODS

2.1 Desk Study

2.1.1 A review of existing data was undertaken as a desk-based exercise to identify ornithological records and designated sites within the Site and surrounding area to inform survey requirements and the ornithology baseline.

Designated Sites

2.1.2 Freely downloadable datasets were searched for information on statutory and non-statutory designated sites within a minimum of 2 km of the Site, in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines for Preliminary Ecological Appraisal (CIEEM, 2017)[8]. This search was extended to 10 km for European sites[9] and to 20 km for European sites designated for wintering geese (based on a maximum foraging range of 20 km for pink-footed and greylag geese)[10]. The search results were restricted to those designated areas with qualifying ornithological interests. Designated sites of interest and the appropriate search radii are as follows:

- Local Nature Conservation Sites
- Local Nature Reserves
- National Nature Reserves
- Sites of Special Scientific Interest (SSSI)

2 km

- SPAs
- Ramsar Sites

10 km

- Sites designated for overwintering geese (SPAs and Ramsar Sites)

20 km

2.1.3 Qualifying features of each site identified within the respective search radii were obtained from the NatureScot Site Link Portal[11]. Where measurements are presented in the findings, these represent the distance of the designated area from the closest point of the Site.

Consultation Exercise

2.1.4 To help inform the ornithological survey programme and the OIA, a consultation exercise was undertaken to request recent historical records of Target Species (i.e. records from the past 10 years (2012-2021 inclusive)) within 2 km of the Site for the Proposed Development. The search was extended to within 6 km of the Site for golden eagle and white-tailed eagle to encompass the core range for these wider ranging species. The following ornithological interest groups were consulted for any relevant data they may hold:

- NatureScot.
- The Royal Society for the Protection of Birds (RSPB).
- Central Scotland Black Grouse & Capercaillie Study Group (CSBGCSG) (RSPB affiliated study group).
- Argyll Raptor Study Group (ARSG).
- Forestry and Land Scotland (FLS).

2.1.5 Data were initially requested in November 2020 with an updated data request sent to all consultees in June 2022.

[8] CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

[9] European sites are a network of sites across the European Union designated for rare and threatened species, and rare natural habitat types, protected in their own right originally under the Birds Directive 2009/147/EC and the Habitats Directive 92/43/EEC and subsequently under the UK Withdrawal from the European Union (Continuity) (Scotland) Act 2021.

[10] SNH (2016). Assessing Connectivity with Special Protection Areas (SPAs) – Guidance, Version 3. SNH, Battleby.

[11] NatureScot (2021) Sitelink. Available online at: https://sitelink.nature.scot/home (Accessed November 2021).

2.2 Ornithology Surveys

2.2.1 A suite of ornithology surveys was undertaken from December 2020 to August 2021 (inclusive) following methodologies recommended by NatureScot (formally Scottish Natural Heritage (SNH)) (SNH, 2017)[12]. Surveys were undertaken across the Route Corridor plus a maximum survey buffer of 2 km (the Survey Area). The surveys were coordinated and managed by WSP and undertaken by a combination of WSP surveyors and Carroll Ecology Ltd with each surveyor having a minimum of three years' experience undertaking bird surveys in upland habitats. Each surveyor possessed, or were named agents on, a Schedule 1 bird survey licence issued by NatureScot. Survey areas described below are shown on **Annex 2 - Figure 8.1.1**.

Flight Activity Surveys

2.2.2 These surveys were designed to record the flight activity of birds utilising the airspace over focal sections of the Route Corridor. The data collected allow the total flight activity and number of birds involved to be estimated over a given timeframe (e.g. breeding season and non-breeding season), as well as showing spatial and temporal flight activity patterns. In turn, this information is used to inform a qualitative assessment of collision risk of the species in question with the OHL.

2.2.3 In order to collect flight activity data, surveys are conducted from Vantage Points (VPs) which offer as wide and as unrestricted a view as possible of the Route Corridor. VPs were selected to target areas of the Route Corridor most likely to be utilised by Target Species. Based on information gathered during the desk study Target Species identified as likely to be present on the site and potentially at risk of collision included golden eagle, black grouse and hen harrier. As these species favour upland moorland habitats the VPs were selected to focus on these areas of the Route Corridor. The susceptibility of particular bird species or individuals to collision with OHL infrastructure is a combination of morphology, visual acuity age/condition and behaviour. EirGrid (2016)[13] provides a detailed account of the factors influencing potential bird collision with OHL infrastructure.

2.2.4 Three VPs were identified to cover focal sections of the Route Corridor during the non-breeding season and four VPs were surveyed during the breeding season. Fewer VPs were required during the non-breeding season due to the limited number of Target Species anticipated to utilise the Site during this time (principally golden eagle and black grouse). The location of VPs during the breeding season were also relocated to reflect the introduction of the additional VP and to achieve adequate coverage of the emerging preferred alignment for the OHL, as confirmed in February 2021 (apart from VP1 which remained in the same location). The non-breeding season flight activity surveys commenced in December, and not September (when non-breeding season surveys would typically commence in accordance with SNH guidance[12]), as initially non-breeding season surveys were scoped out. NatureScot provided evidence of nearby golden eagle ranges in November 2020 and hence non-breeding season flight activity surveys commenced shortly after receiving this advice. The location of selected VP locations and their associated 2 km, 180° viewing arcs and viewsheds from 10 m above ground level are illustrated on **Annex 2 - Figure 8.1.2 and Figure 8.1.3**.

2.2.5 Survey effort was spread throughout the daytime period where daylight hours best represent temporal flight activity patterns. Each survey was undertaken by a single observer in good conditions (i.e. visibility of at least 2 km). Weather and visibility conditions were recorded on an hourly basis including information on wind strength and direction, precipitation and cloud cover.

2.2.6 All VP watches were limited to a maximum of three hours' duration by any single observer, with a minimum of half an hour's break between any two consecutive VP surveys. Simultaneous VPs were not carried out at any VPs with overlapping viewsheds (e.g. breeding season VPs 2 and 3). During each VP

[12] Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore windfarms. SNH Guidance. SNH, Battleby.
[13] EirGrid (2016). EirGrid evidence based environmental studies study 5: Birds.

watch surveyors continuously scanned the airspace within the 2 km, 180° viewshed arc of the respective VP location using the naked eye as well as binoculars to record any and all Target Species. Although a viewshed radius of 2 km was used to record Target Species, observations of birds located outside of this radius (e.g. individuals or flocks of large, easily detectable birds) were also recorded where possible to provide additional context.

2.2.7 Once a bird or flock was detected, it was observed until it had landed or flown out of sight. The paths of all observed flights (flight lines) were drawn directly onto 1:10,000 OS maps while the following associated flight data was also recorded:

- Flight start time;
- Species (where identification was uncertain, observations were identified to species group level at a minimum);
- Number of birds/ flock size;
- Flight duration;
- Bird(s) occupancy at one of three height bands relative to the heigh of the proposed OHL wires (0-10 m, 10-50 m and >50 m) and the duration (in seconds) within each height band, including noting any time of change between height bands; and,
- Behaviour (including territorial or nesting behaviour).

2.2.8 In addition to flights by Target Species, the presence and behaviour of any other notable species which may be potentially vulnerable to the effects of OHLs (so-called secondary species) was also recorded.

2.2.9 All flight activity survey data were entered into ArcView Geographic Information System (GIS) and a corresponding excel spreadsheet. For each flight, the proportion of the total flight time spent within the LoD plus an addition 50 m (i.e. proposed OHL alignment plus 100 m buffer hereafter the referred to as the 'Collison Risk Area' (CRA)) in the three height bands was estimated. This was achieved by measuring the length of the digitised flight line within the CRA in comparison to the total length of the flight and then assigning a proportion of the total duration of the flight in seconds to the CRA. Flights were deemed to be at potential risk of collision with the OHL if they passed over the CRA at heights of between 10-50 m (hereafter referred to as flights at 'Potential Risk of Collison' (PRC)). The height bands selected were precautionary based on the initial estimate of tower heights[14].

2.2.10 Thirty-six hours of survey effort was undertaken at all relevant VPs during the non-breeding season (December 2020 to February 2021 inclusive) and the breeding season (March 2021 to August 2021 inclusive). **Table 2-1** presents a summary of the flight activity survey effort undertaken, further details of which are provided in **Annex 4 - Table 4-1.**

Table 2-1 Summary of the non-breeding season flight activity survey effort

VP	December 2020	January 2021	February 2021
1	6	18	12
2	5:25[15]	18	12
3	6	18	12

Table 2-2 Summary of the breeding season flight activity survey effort

VP	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021
1	6	6	6	6	6	6

[14] Tower heights for the Proposed Development range from approximately 23 to 39 meters.
[15] Only five hours 25 minutes were undertaken at VP2 in December due to low cloud obscuring visibility.

VP	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021
2	6	6	6	6	6	6
3	6	6	6	6	6	6
4	6	6	6	6	6	6

Moorland Breeding Bird Survey

2.2.11 The Route Corridor plus a surrounding 500 m buffer was surveyed for moorland and lowland breeding birds between April and July 2021'. The surveys followed a modified version of the Brown and Shepherd methodology (Brown and Shepherd, 1993)[16] as summarised in Gilbert et al. (1998)[17] and involved four rounds of surveys undertaken between mid-April and early July as recommended by SNH (2017)[12]. Surveys were targeted on areas of open moorland and lowland grassland/ agriculture with the methodology developed to target waders and waterbirds.

2.2.12 During each visit the surveyors covered the survey area on foot to within at least approximately 100 m of all relevant parts of the survey area. The behaviour of all birds seen or heard during the surveys was recorded on large-scale maps using standard British Trust for Ornithology (BTO) coding and notation. Survey visits were undertaken in good, clear weather conditions (wind less than Beaufort force 5). **Annex 4 - Table 4-2** presents summarised details of the moorland breeding bird surveys undertaken.

2.2.13 All breeding bird survey records were entered into ArcView GIS software. These were then analysed in order to identify the minimum number of probable or confirmed breeding territories for all waders and wildfowl recorded. For wading birds, this was done following the methods of Brown and Shepherd (1993) whereby breeding territories were assigned on the basis of at least one registration of birds engaging in territorial behaviour including displaying, singing or alarm calling, distraction displays, territorial disputes or the detection of eggs, nests or young. Where possible, simultaneous registrations of birds displaying such behaviour were used to identify different territories. Where this was not possible, such registrations which were from the same survey visit and were within 500 m of each other (200 m for dunlin) were assumed to be associated with the same territory, while registrations beyond this distance from one another were considered to be from separate, neighbouring territories. For registrations from different survey visits, birds within 1 km of each other (500 m for dunlin) were assumed to be from the same territory.

2.2.14 Based on the territory analysis procedure detailed above, the estimated number of breeding territories held by Target Species was identified within the survey area. The location of each territory marks the estimated centre point of the territory.

2.2.15 To give an indication of passerine diversity within the moorland bird survey area a passerine species list was collated during the surveys.

Scarce Breeding Bird Survey

2.2.16 The Route Corridor plus a surrounding buffer of 2 km was surveyed for scarce breeding birds between early April and mid-August 2021. Due to the lack of plausible effect pathways between the Proposed Development and land on the opposite side of Loch Long this area was not surveyed. Scarce breeding birds were principally defined as raptors listed on Annex I of the EU Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

2.2.17 Survey protocols broadly followed the standard methodologies for assessing raptor populations set out by Hardey et al. (2013)[18]. The surveys involved at least four survey visits undertaken to determine

[16] Brown, A.F. and Shepherd, K, B. (1993). A method for censusing upland breeding waders. Bird Study, 40:3 189-195.
[17] Gilbert, G., Gibbons D.W., and Evans, J. (1998). Bird Monitoring Methods. RSPB, Sandy.
[18] Hardey et al. (2013). Raptors. A Field Guide for Surveys and Monitoring – Third Edition. The Stationery Office

presence, territory occupation and breeding success. **Annex 4 - Table 4-3** presents summarised details of the scarce breeding bird surveys undertaken.

2.2.18 The surveys primarily comprised targeted VP watches over potentially suitable habitats and walkovers focussing effort in areas previously identified with concentrations of bird activity as well as other areas of suitable nesting and foraging habitat such as heather moorland, waterbodies, craggy rock faces, cliffs and steep sided burns. The locations of recent historical nest sites provided by consultees were also inspected during the walkover surveys. The locations of any nest sites or nesting/ territorial activity by scarce breeding birds was recorded, as were any sightings and signs of activity (e.g. prey remains, faecal splashing, plucking posts and pellets). All observations of scarce breeding bird species or sightings of any associated field signs and the locations of flight lines were mapped using standard BTO symbols and activity codes.

Lekking Black Grouse Survey

2.2.19 The Route Corridor plus a surrounding buffer of 1.5 km was surveyed to determine the presence or likely absence of lekking black grouse. The survey protocol followed the methodology detailed in Gilbert et al. (1998)[17]. Two rounds of surveys were conducted between late March and mid-May 2021 and involved walkovers covering all areas of suitable habitat (e.g. areas of short grassland such as in-bye pastures or moorland particularly near young or sparse forest edges). **Annex 4 - Table 4-4** presents summarised details of the lekking black grouse surveys undertaken.

2.2.20 Surveys were undertaken around sunrise up to approximately two hours after dawn in dry and calm conditions with good visibility. Surveyors sought to cover all areas to within 500 m in search of lekking male black grouse and any attending females. Any identified leks were observed from suitable vantage points to avoid disturbance and the number of males (not just displaying birds) and females seen in the lekking area were recorded on each visit. The grid reference and details of any observations or signs of black grouse were also recorded. Birds located 200 m or more apart were considered to represent separate lek sites.

Winter Walkover Survey

2.2.21 The Route Corridor plus a surrounding buffer of 500 m was surveyed to determine the presence of non-breeding Target Species. The survey focused on open areas of moorland and lowland grassland/ agricultural areas with three survey visits undertaken between late November 2020 and early March 2021. The survey was undertaken by a combination of drive around, walkover and ad hoc VPs from suitable locations. The surveyors covered the ground that so that all areas were visited within at least 250m and recorded the species, number and behaviour of Target Species following the methodology described above. **Annex 4 - Table 4-5** presents summarised details of the lekking black grouse surveys undertaken.

2.3 Assumptions and Limitations

2.3.1 As stated in **Paragraph 1.2.2** the proposed OHL alignment at the northern section of the passes to the south of the Preferred Route Corridor. As such the view arc for VP1 (used during both the non-breeding and breeding season flight activity surveys) does not cover the majority of the proposed OHL alignment in this section (approximately 2.5 km of the proposed OHL alignment is 'behind' the VP). The proposed OHL alignment in this section, however, passes through conifer planation woodland that is suboptimal habitat for key Target Species identified during the desk study. As such coverage of this section of the proposed OHL alignment is not a propriety, as similarly the woodland areas at the southern end of the proposed OHL alignment were not covered by flight activity surveys. The lack of coverage of the northern section of the proposed OHL alignment by flight activity surveys is therefore not deemed to

significantly affect the result of the OIA. Results from VP 1 are nonetheless still provided to further inform the ornithology baseline in the wider Survey Area.

2.3.2 Similarly, the proposed OHL alignment at the northern section extends outwith the moorland breeding bird/ winter walkover survey area to the east and the survey areas for black grouse and scarce breeding birds do not cover the full 1.5 km and 2 km respectively from the proposed OHL alignment in this area. The north-eastern section of the Survey Area, however, encompasses conifer plantation, Loch Long and land on the opposite side of Loch Long. As conifer plantation does not support moorland breeding birds and birds occupying land to the east of Loch Land are unlikely to be affected by the Proposed Development this is therefore not deemed to significantly affect the result of the OIA.

3. RESULTS

3.1 Site Overview

3.1.1 The Site is situated to the west of Loch Long and encompasses open upland areas, plantation forestry and glens typical of Argyll. The Site is bisected by two glens, Glen Finart in the north and Strath Eachaig in the south, with higher altitude upland areas characterised by commercial forestry on the steep sided slopes and open upland areas on the summit plateaux. High points in the vicinity of the Site include Am Binnein in the north and Stronchullin Hill in the central areas, which rise to 476 m and 548 m above sea level respectively.

3.2 Desk Study

Designated Sites

3.2.1 Only two designated sites with ornithological qualifying features were located within 2 km of the Site, namely the Holy Loch Local Nature reserve (LNR) and Local Nature Conservation Site (LNCS). These designated sites encompass overlapping areas and are notable for estuarine habitats that support an overwintering shorebird assemblage. The designated sites are located approximately 790 m east of the Site. No European sites were identified within the search parameters identified in Paragraph 2.1.2. The location of the designated sites is shown in **Figure 7.2.2 - 2 km Statutory Natural Heritage Designations and Figure 7.2.3 1 km Non-Statutory Natural Heritage Designations**.

Consultation Exercise

3.2.2 Records of Target Species provided by the consultees are described below and shown in Confidential **Annex 3 - Figure 8.1.4**.

NatureScot

3.2.3 NatureScot provided reports for two separate golden eagle ranges that overlap with the proposed OHL alignment (Austin et al. 2015[19,20]). The proposed OHL alignment crosses the south-eastern extent of territories G/A22 and G/C1 between Towers 1 and 20 and 21 and 29 respectively (territory extents shown on **Annex 3 - Figure 8.1.4**). Range extents and use as predicted by the Predicted Aquila Territories (PAT) model, however, are considered to have key limitations based on information subsequently gathered from satellite tagging golden eagles. The predicted range extents, however, are based on the location of golden eagle breeding sites. Therefore, while the exact range extents and predicted use of territories derived from the PAT model is not reliable it is assumed, for the purposes of this assessment, that the proposed OHL alignment passes through two golden eagle territories (based on known location of breeding sites and proximity to the proposed OHL alignment).

3.2.4 NatureScot also provided results from a recent Golden Eagle Topography model (GET) run across the entire Scottish land mass (including islands). The GET model predicts the air space use of golden eagles based on topography alone[21]. The model is based on GPS telemetry readings gained from tagged juvenile eagles in Scotland. The GET model is considered superior to the PAT model at predicting space use, for both dispersing juveniles and territorial adults[22]. The GET model predicts space used based on a

[19] Austin, S., Fielding, A. H. and Haworth, P. F (2015a). G/C1 Golden eagle range report – Natural Heritage Zone 14 "Argyll West and Islands". Scottish Natural Heritage Commissioned Report No. 827.

[20] Austin, S., Fielding, A. H. and Haworth, P. F (2015b). G/A22 Golden eagle range report – Natural Heritage Zone 14 "Argyll West and Islands". Scottish Natural Heritage Commissioned Report No. 859.

[21] Fielding, A, H., Haworth, P, F., Anderson, D., Benn, S., Dennis, R., Weston, E and Whitfield, A, P (2019). A simple topographical model to predict Golden Eagle *Aquila chrysaetos* space use during dispersal. IBIS, 162(2); 400-415

[22] NatureScot (2021). NatureScot statement on modelling to support the assessment of forestry and wind farm impacts on golden eagles. Available online: https://www.nature.scot/doc/naturescot-statement-modelling-support-assessment-forestry-and-wind-farm-impacts-golden-eagles. (Accessed on June 2022).

standardised preference index (SPI) score ranging from the lowest predicted use, SPI, to the highest predicted use SPI 10. The GET model predicted a high level of use (SPI scores of 8, 9 and 10) across much of the open upland habitats and woodland edge within the identified territories and along and adjacent to the proposed OHL alignment. Any SPI scores of six or greater are likely to be important for golden eagles, so long as the ground is open. The GET model does not predict territorial ranges for PAT territories G/C1 and G/A22 as an accurate prediction of territory extents is only possible tracking territorial birds (e.g., with satellite tags).

Royal Society for the Protection of Birds

3.2.5 Five records of black grouse (all males with a maximum of two birds per record) were provided from three locations. All records were over 1 km from the proposed OHL alignment.

Central Scotland Black Grouse & Capercaillie Study Group

3.2.6 Eleven black grouse records were provided from five locations comprising 10 records of males and one of a female. All records were of either one or two birds. All records were located in the vicinity of the central section of the proposed OHL alignment and were provided at 1 km and 100 m spatial resolution). Four of the locations are within 1 km of the proposed OHL alignment.

Argyll Raptor Study Group

3.2.7 Records of the following species were returned:

- Golden eagle - four nest sites from three known breeding sites were returned. Records were provided from 2019 to 2022 inclusive for the following three breeding sites:
  - Carrick: two nest sites were provided, located approximately 1.2 km and 7.5 km north-west of the Site. Both nest sites are located within the G/A22 golden eagle territory, as predicted by PAT modelling[19,20]. The more distant nest site was occupied in 2019. 2020 and 2020 with breeding only successful (e.g. young fledged) in 2021. The closer nest site was occupied in 2022 when breeding was not successful.
  - Garrachra: the only nest site provided is located approximately 3.3 km north-west of the Site. The nest site was occupied every year from 2019 to 2021 (inclusive) with one young successfully fledged in every year except 2019. No data was provided for 2022.
  - Giant's Knowe: the only nest site provided was approximately 3 km south of the Site. This is a new site first identified in 2022 where breeding was unsuccessful.
- Hen harrier - records from four known breeding sites monitored since 2015 were provided. Three records were provided at a spatial scale of 1 km grid squares and one record provided at 100 m scale. Two breeding sites were identified from 1 km grid squares within c. 500m of the Site at its northern and southern extents, neither of which have been confirmed breeding since 2015. Since 2015 breeding has only been confirmed at two sites over separate years (2016 and 2020) with both sites over 1 km from the Site.
- Peregrine falcon – records from one breeding site monitored in 2021 were provided. The breeding site is approximately 1.1 km west of the Site and was occupied in 2021.
- Barn owl - records from seven known breeding sites were returned at a spatial scale of 100 m grid squares. Of the five breeding sites checked in 2021 no signs of birds were recorded at any of them. Three records were within 500 m of the Site at the southern end. All records were located in woodland.

Forestry and Land Scotland

3.2.8 FLS provided high level information on the potential presence of a breeding pair of white-tailed eagle in the Ardgarten Peninsula area and records of hen harrier but no evidence of breeding.

3.3 Ornithology Surveys

Flight Activity Surveys

3.3.1 Survey results are provided for the non-breeding season and breeding season with a full list of each recorded flight provided in **Annex 4 – Table 4-6.**

Non-Breeding Season

3.3.2 A total of eleven flights by five Target Species were recorded during the non-breeding season flight activity surveys. **Table 3-1** presents a summary of the flight activity results with full details provided **in Annex 4 – Table 5.5**. Flights are shown on **Annex 2 – Figure 8.1.5**.

Table 3-1 Summary of non-breeding season flight activity survey results

Species	Total No. of Flights	Total Number of Birds	Cumulative Flight Duration (Seconds)	No. of Flights at PRC	No. of Birds at PRC	Cumulative Flight Duration at PRC (Seconds)
Golden eagle	6	7	726	1	1	10
Black grouse	2	6	33	1	3	3
Hen harrier	1	1	193	0	0	0
Peregrine falcon	1	1	24	0	0	0
Golden plover	1	1	175	0	0	0

3.3.3 **Golden eagle** was the most frequently recorded species with six flights recorded over the open upland areas of the northern and central sections of the Survey Area. Records comprised displaying and hunting adults and immature birds. All records were of single birds apart from a single record of a pair crossing high over the Survey Area. Four flights crossed the CRA with a single flight, described as displaying, recorded at PRC for approximately ten seconds.

3.3.4 Two **black grouse** flights were recorded in the central section of the Survey Area south of Meall Dubh. Both flights comprised flocks of three birds and both crossed the CRA, one of which was at PRC for three seconds.

3.3.5 One **hen harrier** flight was recorded at the northern end of the Survey Area. The flight comprised an immature bird circling at height to the west of the CRA and therefore not at PRC.

3.3.6 One **peregrine falcon** flight by a single bird was recorded in the northern section of the Survey Area to the west of the CRA and therefore not at PRC.

3.3.7 One **golden plover** flight by a single bird was recorded at the northern end of the Survey Area to the west of the CRA and therefore not at PRC. The bird was passing through the area calling.

Breeding Season

3.3.8 A total of 15 flights by three Target Species were recorded during the breeding season flight activity surveys. **Table 3-2** presents a summary of the flight activity survey results with full details provided in **Annex 4 – Table 5.5**. Flights are shown on **Annex 2 – Figures 8.1.6**.

Table 3-2 Summary of breeding season flight activity survey results

Species	Total No. of Flights	Total Number of Birds	Cumulative Flight Duration (Seconds)	No. of Flights at PCR	No. of Birds at PRC	Cumulative Flight Duration at PRC (Seconds)
Hen harrier	11	11	1186	2	2	15
Golden eagle	3	4	689	2	2	44
Red kite	1	1	120	0	0	0

3.3.9 **Hen harrier** was the most frequently recorded species with 11 flights recorded. Flights were all of single hunting or commuting males with two birds recorded carrying food in a south-westerly direction away from the proposed OHL alignment. Of these flights four crossed the CRA with two recorded at PRC for 15 seconds.

3.3.10 Three **golden eagle** flights were recorded comprising two individual adults (one identified as a female) and an adult pair. The pair were displaying at height above the Survey Area in the northern section and the two remaining flights comprised birds mobbed by buzzards in the central section. Both of these flights were recorded at PRC over a section of the flight paths for a cumulative flight duration of 44 seconds.

3.3.11 One **red kite** flight was recorded comprising a single adult soaring high above the Survey Area and therefore not at PRC.

Moorland Breeding Bird Survey

3.3.12 The only breeding territories recorded during the moorland breeding bird survey were two common sandpiper territories along the River Eachaig. The territory centre points were located approximately 500 m south and 650 m west of the closest point of the Site respectively. No territories were recorded in the open upland areas of the survey area. Two snipe and a single curlew were recorded in the upland areas during surveys undertaken in April 2021, however as no further observations were recorded during the remaining surveys no breeding territories were present. Breeding territories are shown in **Annex 2 – Figure 8.1.7** and a passerine species list is provided in **Annex 4 – Table 4-7**.

Scarce Breeding Bird Survey

3.3.13 No territories of scarce breeding birds were recorded. Observations of scarce breeding birds, including those recorded during the moorland breeding bird survey, are summarised below:

- Golden eagle – a single adult in flight approximately 1.5 km west of the proposed OHL alignment. No breeding sites were located in the vicinity of breeding locations provided by the ARSG (from those provided within the Survey Area).
- Hen harrier – two records of individual hunting males in close proximity to the proposed OHL alignment in the northern and central areas. No breeding sites were located in the vicinity of breeding locations provided by the ARSG (from those provided within the Survey Area).
- Osprey – flight by an individual bird over woodland at the southern end of the proposed OHL alignment.
- Barn owl – the breeding sites provided by the ARSG were visited during the surveys. Based on their locations it was assumed that all records related to artificial nest boxes. No sign of any nest boxes was recorded among otherwise unsuitable nesting habitat (conifer plantation or clear-fell) at four of the sites and two dilapidated nest boxes were recorded at two sites.

Lekking Black Grouse Survey

3.3.14 The survey identified two black grouse leks, both occupied by single males, in the central section of the Survey Area. One lek was located directly adjacent to the proposed OHL alignment and the other approximately 1.2 km west of the proposed OHL alignment.

3.3.15 The following observations of black grouse were also recorded during the flight activity surveys, moorland breeding bird surveys and winter walkover surveys respectively:

- Two records of individual lekking male black grouse recorded during the flight activity surveys in February from VP1 (birds were heard calling, not in flight).
- A single male black grouse was flushed in July 2021 during the moorland breeding bird surveys from upland habitat approximately 500 m west of the proposed OHL alignment at the northern end.
- Six records of black grouse comprising 12 birds were recorded within 1 km of the proposed OHL alignment at the northern end. These records included a total of 8 birds, comprising two groups of three males (one confirmed as lekking) and two females recorded during a single survey in December 2020.

3.3.16 The above black grouse records are displayed in **Annex 2 – Figure 8.1.8**.

Winter Walkover Survey

3.3.17 Eight Target Species were recorded during the winter walkover surveys (**Table 3-3**). Records are described further below and shown in **Annex 2 – Figure 8.1.9** (except black grouse records, which are shown on **Annex 2 – Figure 8.1.8**).

- Golden eagle – an adult pair and a single adult recorded at the northern end of the survey area during December and February respectively.
- Curlew – five records comprising 21 birds, all of which were recorded on or adjacent to Finart Bay at the eastern edge of the survey area.
- Oystercatcher - five records comprising 76 birds, all of which were recorded on or adjacent to Finart Bay at the eastern edge of the survey area.
- Redshank - three records comprising seven birds, all of which were recorded at Finart Bay at the eastern edge of the survey area.
- Snipe – three records of individual birds recorded in the open upland areas in the centre and northern ends of the survey area.
- Mallard – two records comprising 13 birds recorded in Strath Eachaig.
- Red grouse – four records comprising seven birds recorded in the open upland areas in the central and southern sections of the survey area.

Table 3-3 Summary of winter walkover survey results

Species	Peak Count per Month*		
	December 2020	January 2021	February 2021
Golden eagle	2	0	1
Black grouse	8	4	0
Curlew	13	8	0
Oystercatcher	72	4	0
Redshank	6	1	0
Snipe	0	2	1

Species	Peak Count per Month*		
	December 2020	January 2021	February 2021
Mallard	13	0	0
Red grouse	0	6	1

* - December survey visit included one survey in November 2020 (22nd) and February survey included one survey in March (1st)

ANNEX 1 SPECIES LIST, CONSERVATION STATUS AND LEGAL PROTECTION

Table 0-1 Species list, conservation status and legal protection

Species	Scientific Name	Conservation Status*				
		Annex 1	Sch1	SBL	BoCC Red Listed	LBAP Priority Species
Barn owl	*Tyto alba*		✓	✓		
Black grouse	*Lyrurus tetrix*			✓	✓	✓
Blackbird	*Turdus merula*					
Blackcap	*Sylvia atricapilla*					
Blue tit	*Cyanistes caeruleus*					
Chaffinch	*Fringilla coelebs*					
Coal tit	*Periparus ater*					
Common sandpiper	*Actitis hypoleucos*					
Crossbill	*Loxia curvirostra*		✓			
Cuckoo	*Cuculus canorus*			✓	✓	✓
Curlew	*Numenius arquata*			✓	✓	✓
Dipper	*Cinclus cinclus*					
Dunnock	*Prunella modularis*			✓		
Goldcrest	*Regulus regulus*					
Golden eagle	*Aquila chrysaetos*	✓	✓	✓		✓
Golden plover	*Pluvialis apricaria*	✓		✓		✓
Goldfinch	*Carduelis carduelis*					
Grey heron	*Ardea cinerea*					
Hen harrier	*Circus cyaneus*	✓	✓	✓	✓	✓
Herring gull	*Larus argentatus*			✓	✓	
Hooded crow	*Corvus cornix*			✓		
House sparrow	*Passer domesticus*			✓	✓	
Jay	*Garrulus glandarius*					
Lesser black-backed gull	*Larus fuscus*					
Lesser redpoll	*Acanthis cabaret*			✓	✓	
Linnet	*Linaria cannabina*			✓	✓	
Long-tailed tit	*Aegithalos caudatus*					
Mallard	*Anas platyrhynchos*					
Meadow pipit	*Anthus pratensis*					
Mistle thrush	*Turdus viscivorus*				✓	

Species	Scientific Name	Conservation Status*				
		Annex 1	Sch1	SBL	BoCC Red Listed	LBAP Priority Species
Osprey	*Pandion haliaetus*	✓	✓	✓		✓
Oystercatcher	*Haematopus ostralegus*					
Peregrine	*Falco peregrinus*	✓	✓	✓		✓
Raven	*Corvus corax*					
Red grouse	*Lagopus lagopus scotica*			✓		✓
Red kite	*Milvus milvus*	✓	✓	✓		
Redshank	*Tringa totanus*					✓
Robin	*Erithacus rubecula*					
Rook	*Corvus frugilegus*					
Sand martin	*Riparia riparia*					
Siskin	*Spinus spinus*			✓		
Skylark	*Alauda arvensis*			✓	✓	✓
Snipe	*Gallinago gallinago*					
Song thrush	*Turdus philomelos*			✓		✓
Stonechat	*Saxicola rubicola*					
Swallow	*Hirundo rustica*					
Swift	*Apus apus*			✓	✓	✓
Tree pipit	*Anthus trivialis*			✓	✓	
Whinchat	*Saxicola rubetra*				✓	
White-tailed sea eagle	*Haliaeetus albicilla*	✓	✓	✓		
Willow warbler	*Phylloscopus trochilus*					
Woodpigeon	*Columba palumbus*					
Wren	*Troglodytes troglodytes*					

* - See paragraph 1.2.4 for definitions of conservation and legislative categories

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ANNEX 2 ORNITHOLOGY SURVEY FIGURES

N

Key

- Proposed OHL Alignment
- Helicopter Operation Flight Routes: New Tower Steelwork Installation
- Indicative Helicopter Operation Compound
- Borrow Pit Search Area
- Proposed Access
- Preferred Route
- Moorland Breeding Bird Survey and Winter Walkover Survey Area
- Black Grouse Survey Area
- Scarce Breeding Bird Survey Area
- Flight Activity Survey Vantage Points - Non-Breeding Season
- Flight Activity Survey Vantage Points - Breeding Season

0 500 1,000

Metres

Scottish & Southern Electricity Networks

TRANSMISSION

Project:

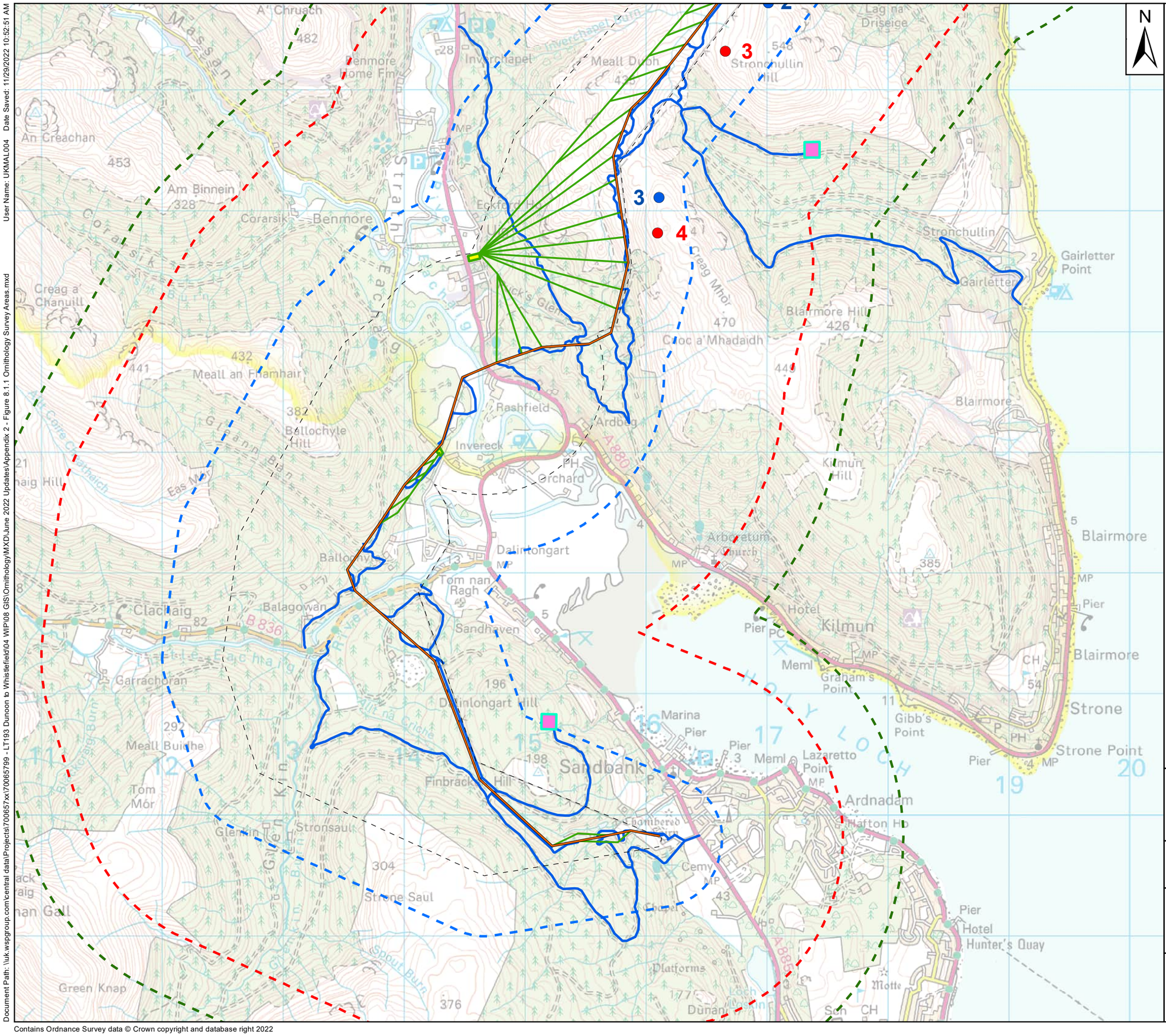
Dunoon to Loch Long 132kV OHL Rebuild

Title

Figure 8.1.1
Ornithology Survey Areas

Date: 11/29/2022 Scale: 30,000 @ A3

Drawn: MAL Checked: IM Approved: RW



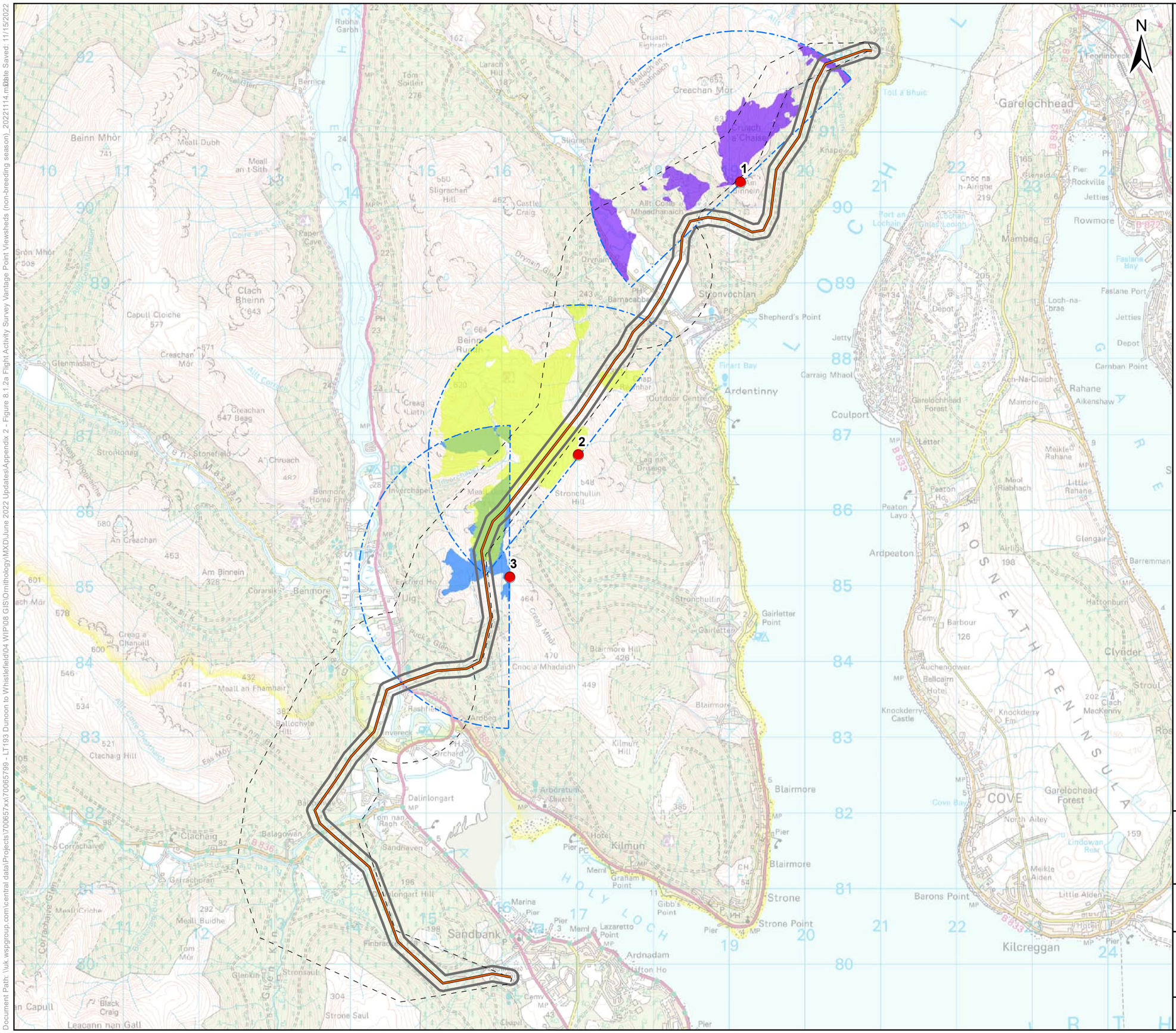
Scottish & Southern Electricity Networks
TRANSMISSION

Project:
Dunoon to Loch Long 132kV OHL Rebuild

Title
Figure 8.1.1
Ornithology Survey Areas

Date: 11/29/2022 Scale: 30,000 @ A3

Drawn: MAL Checked: IM Approved: RW



Key

- Proposed OHL Alignment
- Vantage Point Location
- Collision Risk
- Preferred Route
- Vantage Point 1 Zone of Theoretical Visibility (ZTV)
- Vantage Point 2 ZTV
- Vantage Point 3 ZTV

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

0 1 2

Kilometres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.2a
Non-Breeding Season Flight Activity
Vantage Point Viewsheds

Date: Tuesday, November 15, 2022 Scale: 48,264 @ A3

Drawn: MAL Checked: IM Approved: RW

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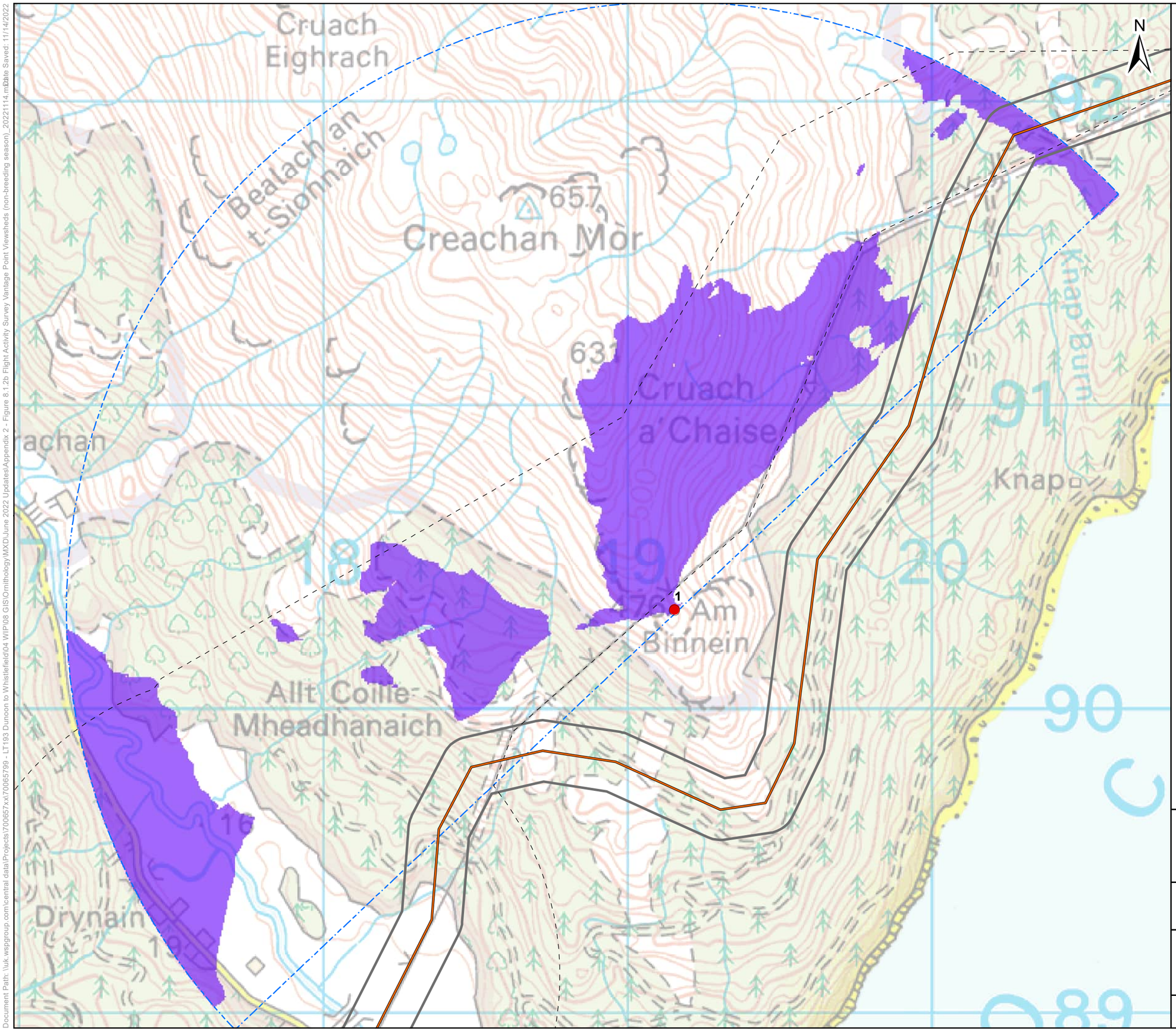

Key

- Proposed OHL Alignment
- Vantage Point Location
- Collision Risk Area
- Preferred Route
- Vantage Point 1 Zone of Theoretical Visibility (ZTV)

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

0 250 500

Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.2b
Non-Breeding Season Flight Activity
Vantage Point Viewsheds
Sheet 1 of 3

Date: Monday, November 14, 2022 Scale: 12,000 @ A3

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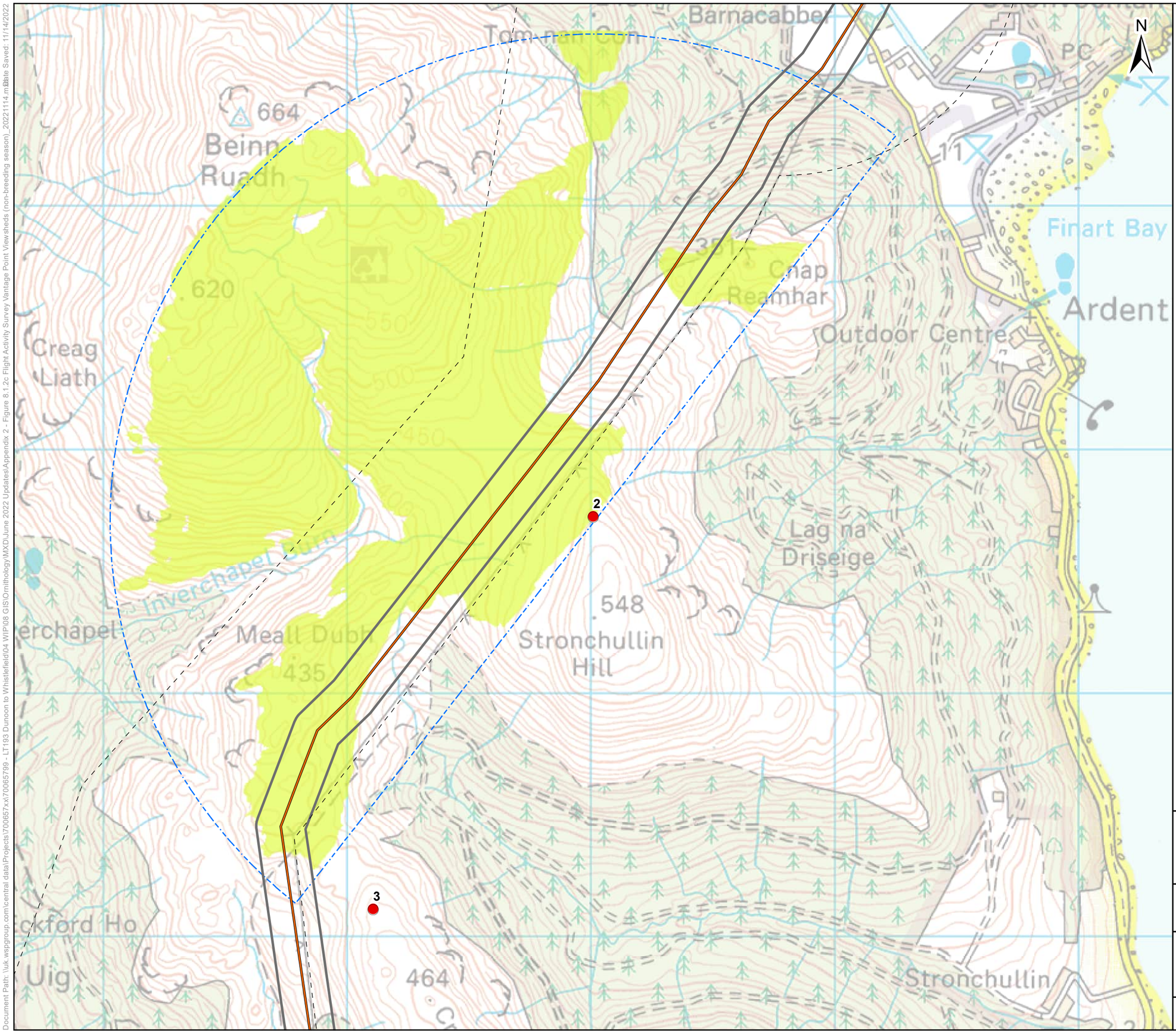

Key

- Proposed OHL Alignment
- Vantage Point Location
- Collision Risk
- Preferred Route
- Vantage Point 2 Zone of Theoretical Visibility (ZTV)

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

0 250 500

Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.2c
Non-Breeding Season Flight Activity
Vantage Point Viewsheds
Sheet 2 of 3

Date: Monday, November 14, 2022 Scale: 15,000 @ A3

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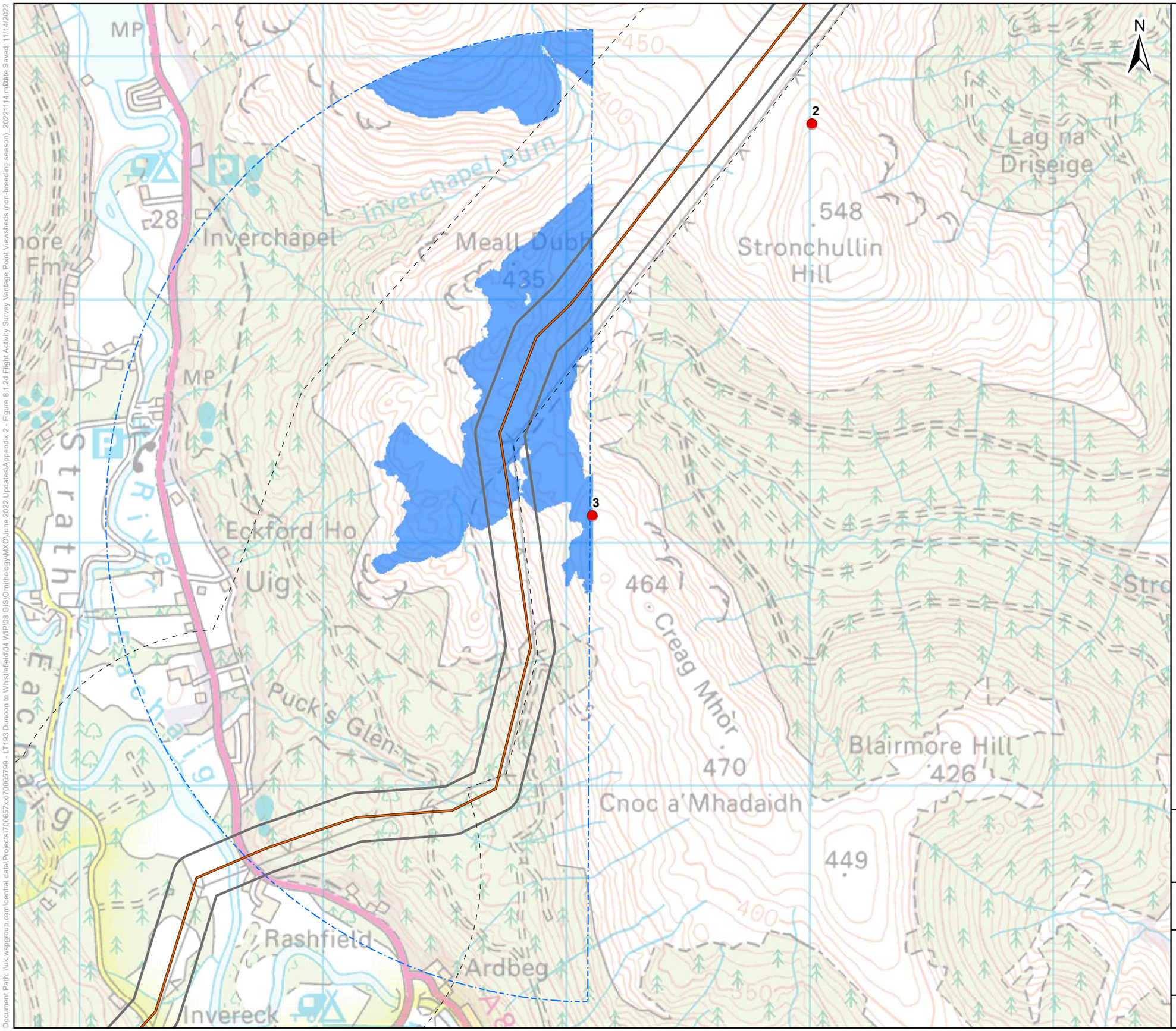

Key

- Proposed OHL Alignment
- Vantage Point Location
- Collision Risk
- Preferred Route
- Vantage Point 3 Zone of Theoretical Visibility (ZTV)

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

0 250 500

Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.2d
Non-Breeding Season Flight Activity
Vantage Point Viewsheds
Sheet 3 of 3

Date: Monday, November 14, 2022 Scale: 15,000 @ A3

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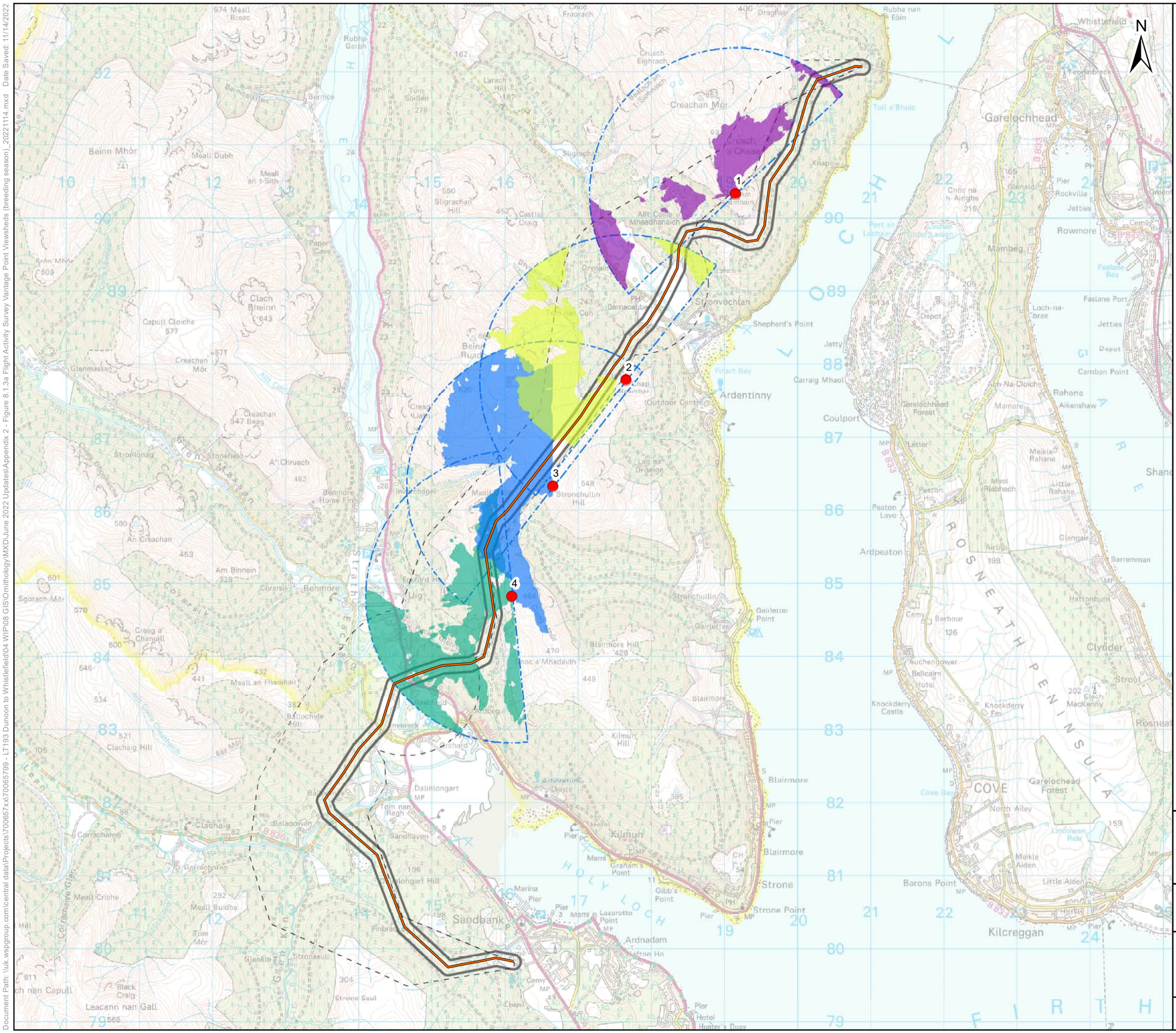

Key

- Vantage Point Location
- Proposed OHL Alignment
- Collision Risk Area
- Preferred Route
- Vantage Point 1 Zone of Theoretical Visibility (ZTV)
- Vantage Point 2 ZTV
- Vantage Point 3 ZTV
- Vantage Point 4 ZTV

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

0 1 2
Kilometres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.3a
Breeding Season Flight Activity
Vantage Point Viewsheds

Date: Monday, November 14, 2022 Scale: 50,000 @ A3
Drawn: MAL Checked: IM Approved: RW

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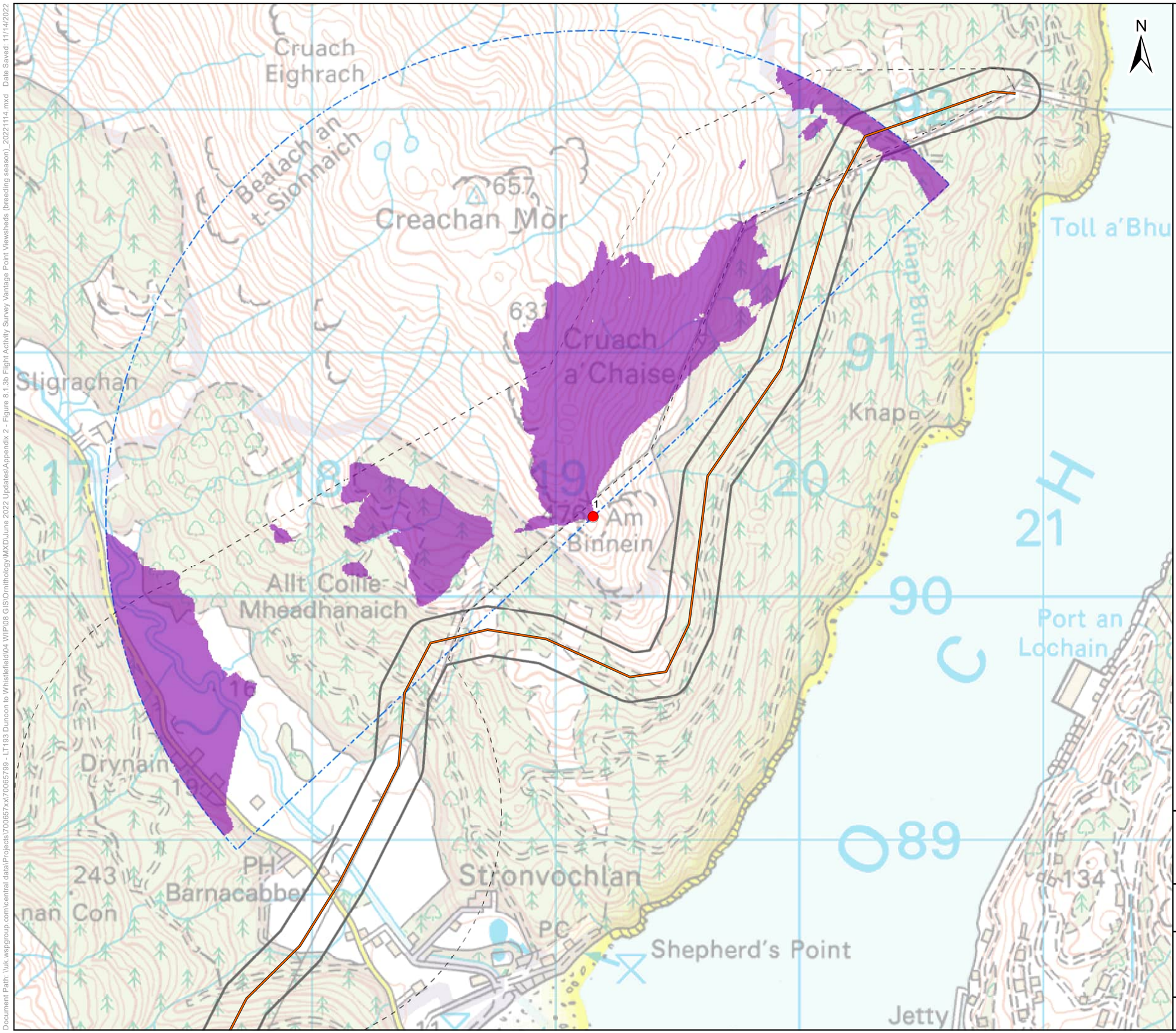

Key

- Vantage Point Location
- Proposed OHL Alignment
- Collision Risk Area
- Preferred Route
- Vantage Point 1 Zone of Theoretical Visibility (ZTV)

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

250 0 250

Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.3b
Breeding Season Flight Activity
Vantage Point Viewsheds
Sheet 1 of 4

Date: Monday, November 14, 2022 Scale: 15,000 @ A3

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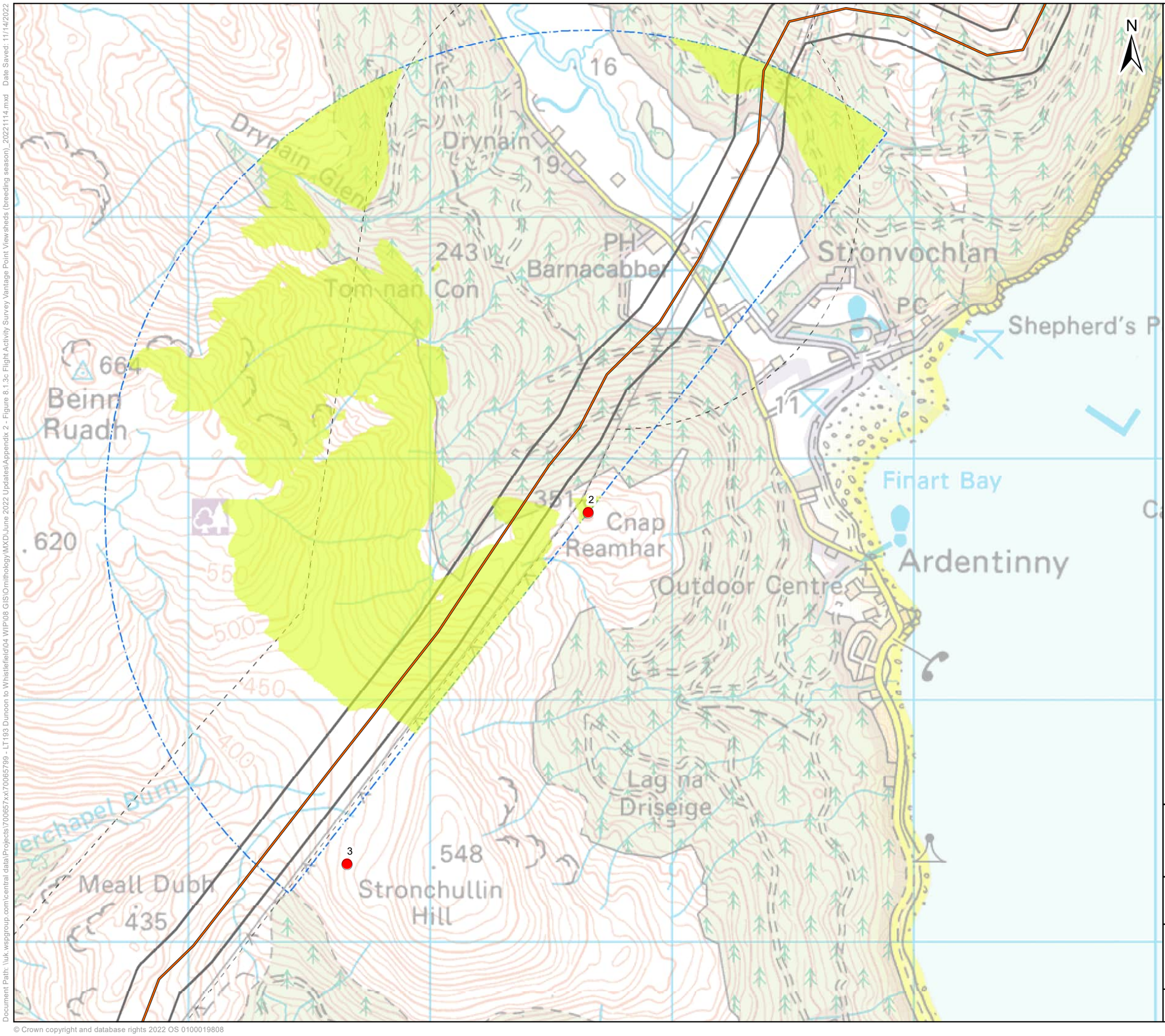

Key

- Vantage Point Location
- Proposed OHL Alignment
- Collision Risk Area
- Preferred Route
- Vantage Point 2 Zone of Theoretical Visibility (ZTV)

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

0 250 500
Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.3c
Breeding Season Flight Activity
Vantage Point Viewsheds
Sheet 2 of 4

Date: Monday, November 14, 2022 Scale: 15,000 @ A3
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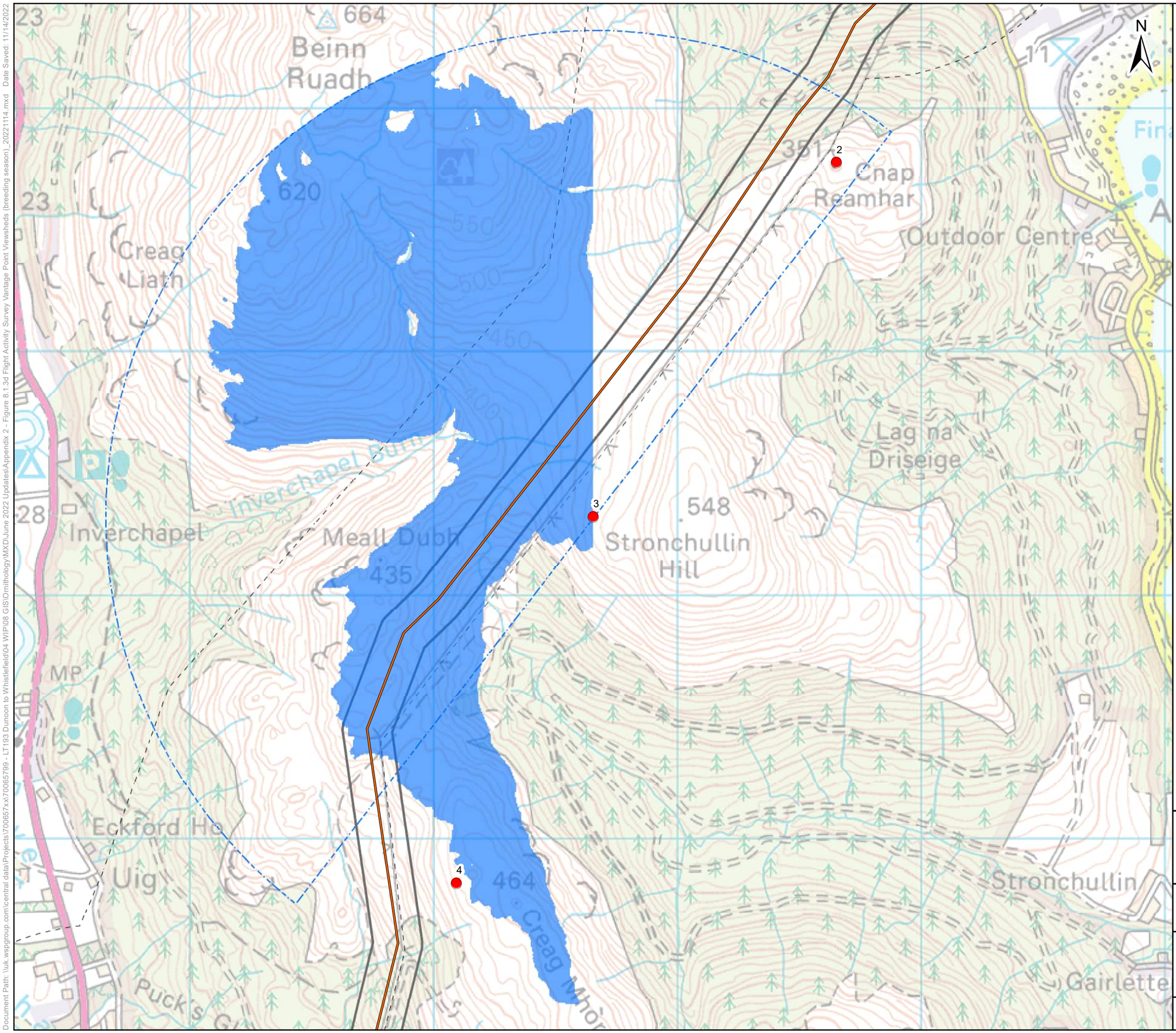

Key

- Vantage Point Location
- Proposed OHL Alignment
- Collision Risk Area
- Preferred Route
- Vantage Point 3 Zone of Theoretical Visibility (ZTV)

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

0 250 500
Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.3d
Breeding Season Flight Activity
Vantage Point Viewsheds
Sheet 3 of 4

Date: Monday, November 14, 2022 Scale: 15,000 @ A3
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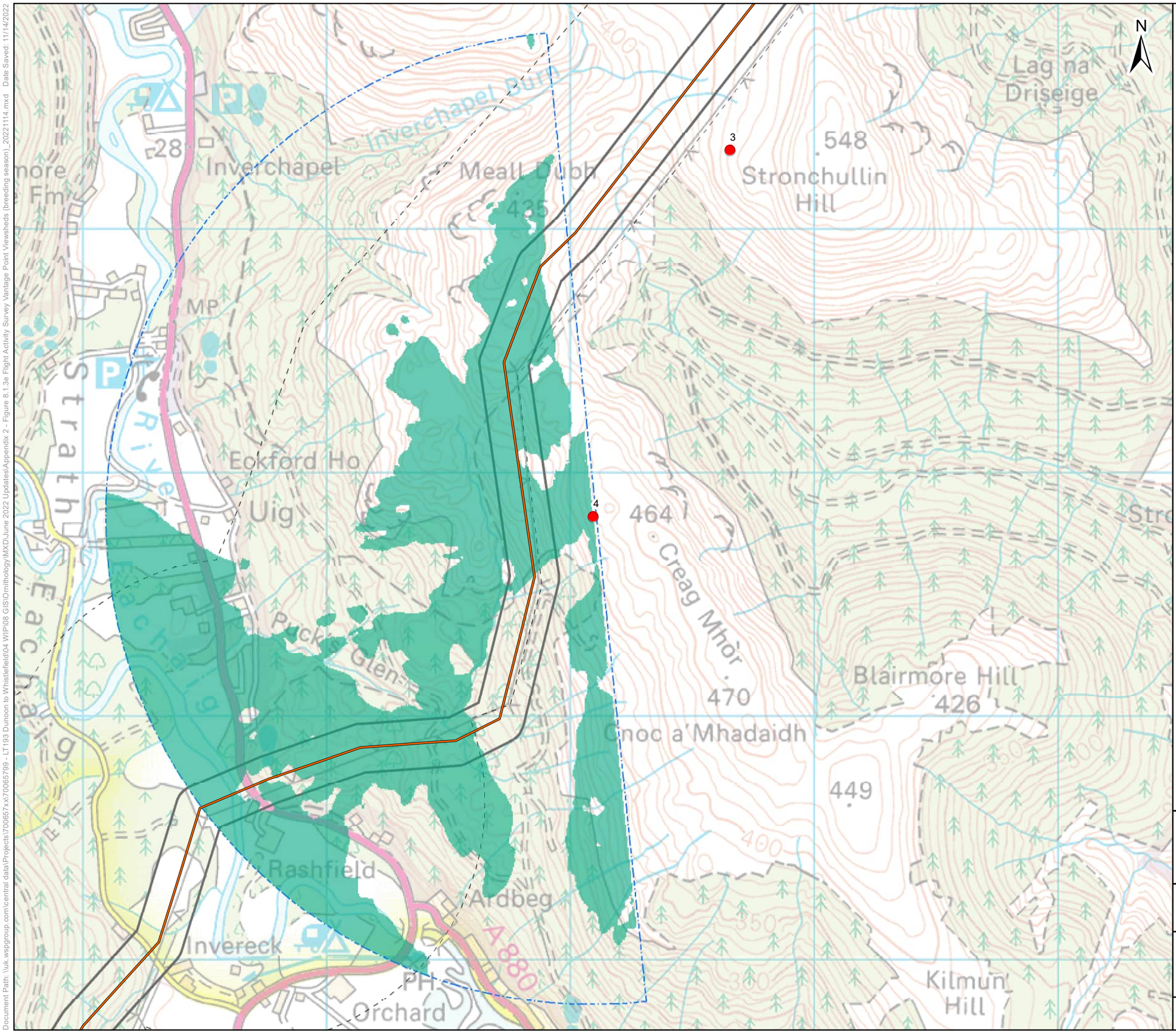

The ZTV is calculated based on the OHL height of 10m and a viewer height of 1.8m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 5 data. Earth curvature and atmospheric refraction have been taken into consideration.

0 250 500
Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.3e
Breeding Season Flight Activity
Vantage Point Viewsheds
Sheet 4 of 4

Date: Monday, November 14, 2022 Scale: 15,000 @ A3
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N

Key

- Proposed OHL Alignment
- Existing OHL
- Vantage Points - Non-Breeding Season
- Collision Risk Area

Flights at Potential Risk of Collision

- Golden Eagle
- Black Grouse

Flights not at Potential Risk of Collision

- Black Grouse
- Golden Eagle
- Golden Plover
- Hen Harrier
- Peregrine

0 1 2

Kilometres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Dunoon to Loch Long 132kV OHL Rebuild

Title: Figure 8.1.5 Flight Activity Survey Results (Non-Breeding Season)

Date: 11/24/2022 Scale: 50,000 @ A3

Drawn: MAL Checked: IM Approved: RW

Key

- Proposed OHL Alignment
- Existing OHL
- Vantage Points - Breeding Season
- Collision Risk Area

Flights at Potential Risk of Collision

- Golden Eagle
- Hen Harrier

Flights not at Potential Risk of Collision

- Golden Eagle
- Hen Harrier
- Red Kite

0 1 2

Kilometres

Scottish & Southern Electricity Networks

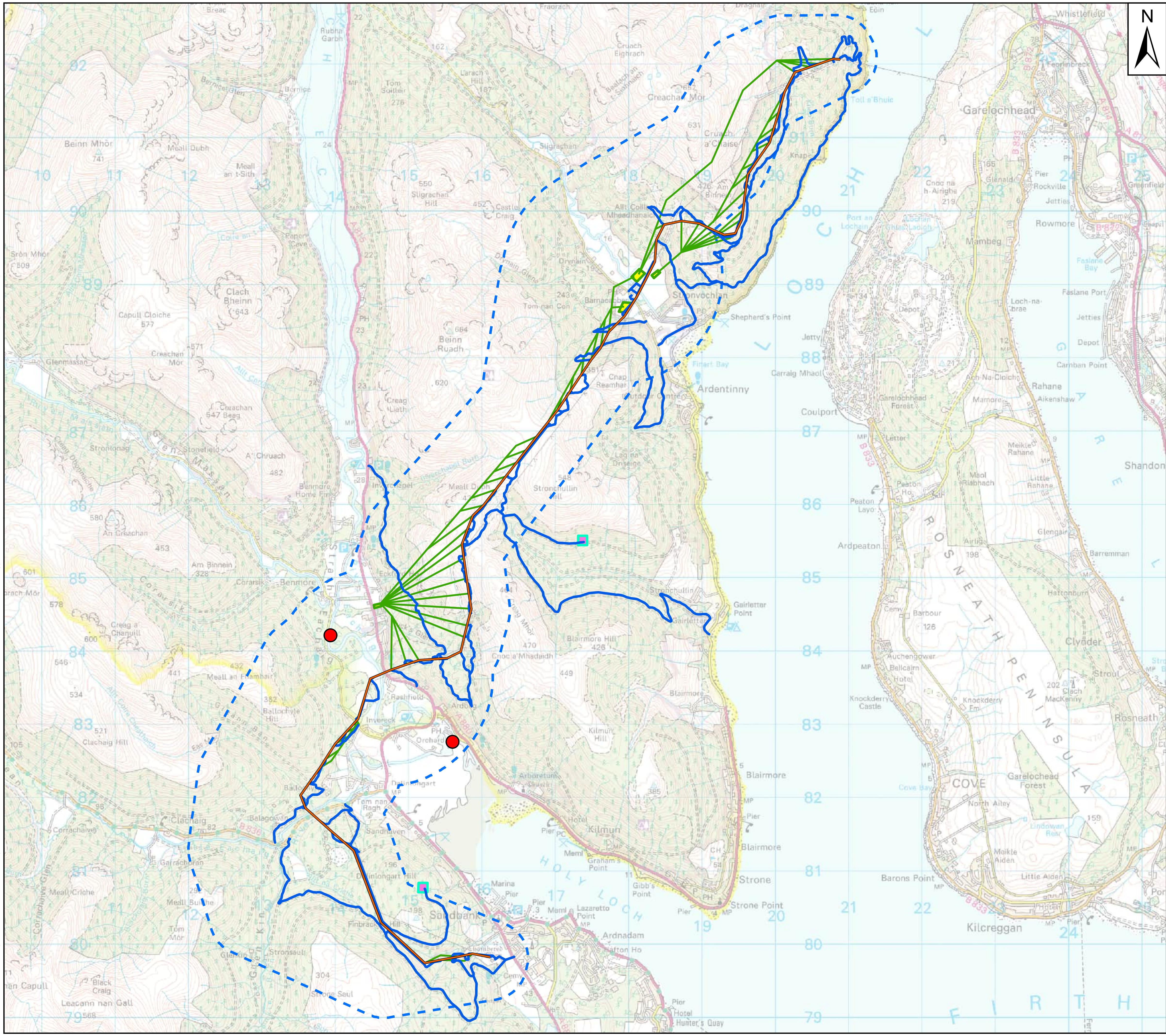
TRANSMISSION

Dunoon to Loch Long 132kV OHL Rebuild

Figure 8.1.6
Flight Activity Survey Results
(Breeding Season)

Date: 11/24/2022 Scale: 50,000 @ A3

Drawn: MAL Checked: IM Approved: RW



Key

- Proposed OHL Alignment
- Proposed Access
- Helicopter Operation Flight Routes: New Tower Steelwork Installation
- Indicative Helicopter Operation Compound
- Borrow Pit Search Area
- Moorland Breeding Bird Survey Area

Moorland Breeding Bird Survey Territories

- Common Sandpiper

0 1 2
Kilometres

Scottish & Southern Electricity Networks
TRANSMISSION

Project:
Dunoon to Loch Long 132kV OHL Rebuild

Title
Figure 8.1.7
Moorland Breeding Bird Survey Results

Date:	11/29/2022	Scale:	50,000 @ A3
Drawn: MAL	Checked: IM	Approved: RW	

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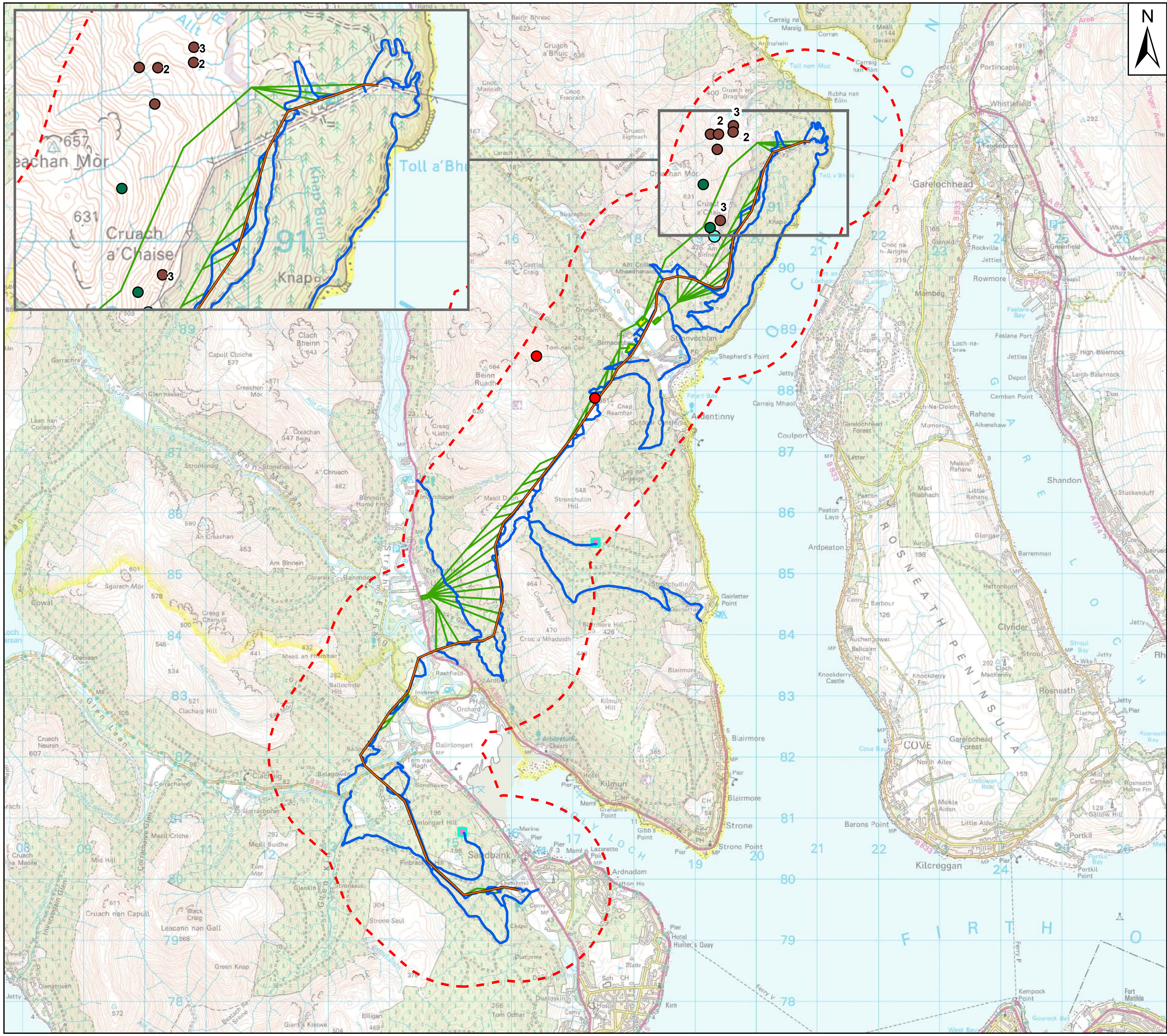

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Key

- Proposed OHL Alignment
- Proposed Access
- Borrow Pit Search Area
- Helicopter Operation Flight Routes: New Tower Steelwork Installation
- Indicative Helicopter Operation Compound
- Black Grouse Survey Area

Lekking Black Grouse Survey Records

- Black Grouse

Flight Activity Survey Records (Not In Flight)

- Black Grouse

Moorland Breeding Bird Survey Records

- Black Grouse

Winter Walkover Records

- Black Grouse

Labelled where number (flock size) is greater than 1.

0 1 2 3
Kilometres

Scottish & Southern Electricity Networks
TRANSMISSION

Project:

Dunoon to Loch Long 132kV OHL Rebuild

Title

Figure 8.1.8
Lekking Black Grouse Survey Results

Date:	11/29/2022			Scale:	60,000 @ A3
Drawn:	MAL	Checked:	JA	Approved:	RW

N

Key

- Proposed OHL Alignment
- Proposed Access
- Helicopter Operation Flight Routes: New Tower Steelwork Installation
- Indicative Helicopter Operation Compound
- Borrow Pit Search Area
- Winter Walkover Survey Area

Winter Walkover Survey Results

- Curlew
- Golden Eagle
- Oystercatcher
- Red Grouse
- Redshank
- Snipe

Labelled where number (flock size) is greater than 1

0 500 1,000
Metres

INSET

Scale = 1:10,000

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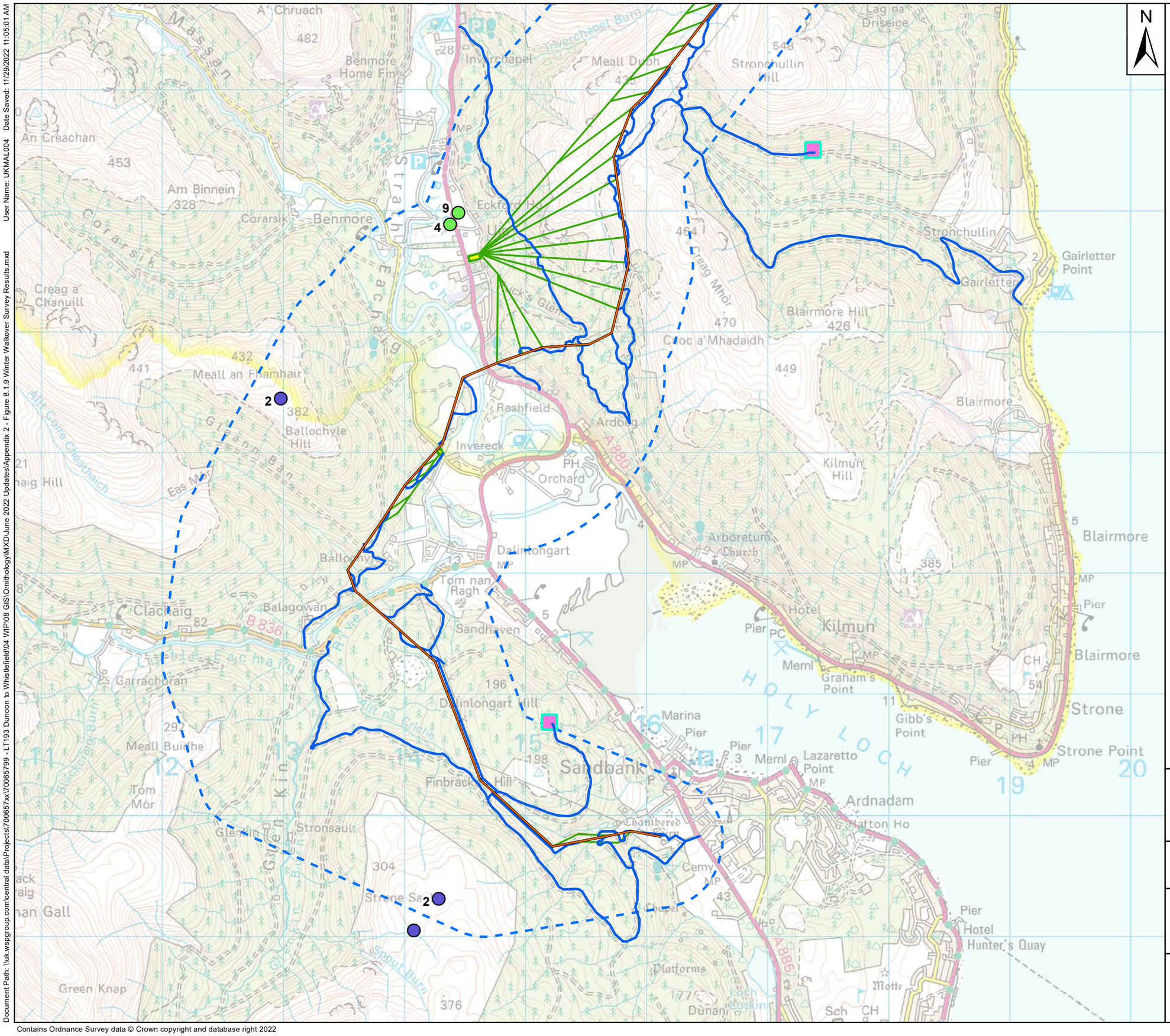
Project:
Dunoon to Loch Long 132kV OHL Rebuild

Title
Figure 8.1.9
Winter Walkover Survey Results
Sheet 1 of 2

Date: 11/29/2022 Scale: 30,000 @ A3

Drawn: MAL Checked: IM Approved: RW



Project:
Dunoon to Loch Long 132kV OHL Rebuild

Title
Figure 8.1.9
Winter Walkover Survey Results
Sheet 2 of 2

Date: 11/29/2022 Scale: 30,000 @ A3

Drawn: MAL Checked: IM Approved: RW

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Scottish & Southern Electricity Networks

TRANSMISSION

ANNEX 3 CONFIDENTIAL ORNITHOLOGY FIGURE

ANNEX 4 ORNITHOLOGY SURVEY DETAILS

Table 4-1 Flight activity survey effort

Month	Date	VP	Start time	End time	Duration (hrs)
December	17/12/2020	1	08:50	11:50	03:00
December	17/12/2020	1	12:20	15:20	03:00
December	09/12/2020	2	08:50	11:50	03:00
December	09/12/2020	2	12:20	14:45	02:25*
December	15/12/2020	3	08:40	11:40	03:00
December	15/12/2020	3	12:10	15:10	03:00
January	15/01/2021	1	08:20	11:20	03:00
January	15/01/2021	1	11:50	14:50	03:00
January	23/01/2021	1	09:10	12:10	03:00
January	23/01/2021	1	12:40	15:40	03:00
January	27/01/2021	1	08:45	11:45	03:00
January	27/01/2021	1	12:15	15:15	03:00
January	20/01/2021	2	09:45	12:45	03:00
January	20/01/2021	2	13:15	16:15	03:00
January	25/01/2021	2	09:45	12:45	03:00
January	25/01/2021	2	13:15	16:15	03:00
January	30/01/2021	2	08:30	11:30	03:00
January	30/01/2021	2	12:00	15:00	03:00
January	12/01/2021	3	09:30	12:30	03:00
January	12/01/2021	3	13:00	16:00	03:00
January	23/01/2021	3	10:10	13:10	03:00
January	23/01/2021	3	13:40	16:40	03:00
January	27/01/2021	3	09:30	12:30	03:00
January	27/01/2021	3	13:00	16:00	03:00
February	26/02/2021	1	10:30	13:30	03:00
February	26/02/2021	1	14:00	17:00	03:00
February	28/02/2021	1	10:45	13:45	03:00
February	28/02/2021	1	14:15	17:15	03:00
February	16/02/2021	2	07:55	10:55	03:00
February	16/02/2021	2	11:25	14:25	03:00
February	17/02/2021	2	11:15	14:15	03:00
February	17/02/2021	2	14:45	17:45	03:00
February	26/02/2021	3	10:45	13:45	03:00

Scottish & Southern Electricity Networks

TRANSMISSION

Month	Date	VP	Start time	End time	Duration (hrs)
February	26/02/2021	3	14:15	17:15	03:00
February	28/02/2021	3	14:40	17:40	03:00
February	28/02/2021	3	11:10	14:10	03:00
March	15/03/2021	1	08:15	11:15	03:00
March	15/03/2021	1	11:45	14:45	03:00
March	19/03/2021	2	08:45	11:45	03:00
March	19/03/2021	2	12:15	15:15	03:00
March	15/03/2021	3	08:55	11:55	03:00
March	15/03/2021	3	12:25	15:25	03:00
March	19/03/2021	4	09:30	12:30	03:00
March	19/03/2021	4	13:00	16:00	03:00
April	16/04/2021	1	08:45	11:45	03:00
April	16/04/2021	1	12:15	15:15	03:00
April	23/04/2021	2	12:15	15:15	03:00
April	23/04/2021	2	15:45	18:45	03:00
April	16/04/2021	3	08:40	11:40	03:00
April	16/04/2021	3	12:10	15:10	03:00
April	23/04/2021	4	12:15	15:15	03:00
April	23/04/2021	4	15:45	18:45	03:00
May	29/05/2021	1	10:50	13:50	03:00
May	29/05/2021	1	14:20	17:20	03:00
May	19/05/2021	2	15:20	18:20	03:00
May	19/05/2021	2	18:50	21:50	03:00
May	29/05/2021	3	10:10	13:10	03:00
May	29/05/2021	3	13:45	16:45	03:00
May	30/05/2021	4	14:40	17:40	03:00
May	30/05/2021	4	18:10	21:10	03:00
June	29/06/2021	1	11:00	14:00	03:00
June	29/06/2021	1	14:30	17:30	03:00
June	25/06/2021	2	10:00	13:00	03:00
June	25/06/2021	2	13:30	16:30	03:00
June	29/06/2021	3	10:30	13:30	03:00
June	29/06/2021	3	14:00	17:00	03:00
June	25/06/2021	4	10:20	13:20	03:00
June	25/06/2021	4	13:50	16:50	03:00
July	28/07/2021	1	10:30	13:30	03:00

Month	Date	VP	Start time	End time	Duration (hrs)
July	28/07/2021	1	14:00	17:00	03:00
July	26/07/2021	2	10:00	13:00	03:00
July	26/07/2021	2	13:30	16:30	03:00
July	27/07/2021	3	10:00	13:00	03:00
July	27/07/2021	3	13:30	16:30	03:00
July	26/07/2021	4	10:20	13:20	03:00
July	26/07/2021	4	13:50	16:50	03:00
August	20/08/2021	1	11:15	14:15	03:00
August	20/08/2021	1	14:45	17:45	03:00
August	16/08/2021	2	12:55	15:55	03:00
August	16/08/2021	2	16:25	19:25	03:00
August	20/08/2021	3	10:40	13:40	03:00
August	20/08/2021	3	14:10	17:10	03:00
August	16/08/2021	4	12:35	15:35	03:00
August	16/08/2021	4	16:05	19:05	03:00

* - only 2:25 hours surveyed due to low cloud

Table 4-2 Moorland breeding bird survey effort

Month	Date	Start time	End time	Duration (hrs)
April	24/04/2021	08:30	14:30	06:00
April	24/04/2021	08:00	14:00	06:00
April	30/04/2021	08:20	14:55	06:35
May	19/05/2021	07:15	13:15	06:00
May	19/05/2021	07:30	13:30	06:00
May	20/05/2021	06:00	12:00	06:00
June	16/06/2021	08:00	14:00	06:00
June	16/06/2021	08:30	14:30	06:00
June	18/06/2021	08:30	14:45	06:15
July	23/07/2021	08:30	14:30	06:00
July	23/07/2021	08:30	14:45	06:15
July	23/07/2021	08:30	14:30	06:00

Table 4-3 Scarce breeding bird survey effort

Month	Date	Start time	End time	Duration (hrs)
April	09/04/2021	08:30	15:30	07:00
April	15/04/2021	08:30	16:30	08:00
April	29/04/2021	09:25	16:10	06:45
May	20/05/2021	07:50	10:50	03:00
May	20/05/2021	07:30	10:30	03:00
May	28/05/2021	08:15	14:15	06:00
May	28/05/2021	12:00	18:00	06:00
June	10/06/2021	10:00	16:00	06:00
June	28/06/2021	08:45	14:45	06:00
July	27/07/2021	10:00	16:00	06:00
August	17/08/2021	10:05	16:05	06:00
August	17/08/2021	09:50	15:50	06:00

Table 4-4 Lekking black grouse survey effort

Month	Date	Start time	End time	Duration (hrs)
April	24/04/2021	05:00	08:00	03:00
April	24/04/2021	05:00	08:00	03:00
April	30/04/2021	04:40	07:40	03:00
May	19/05/2021	04:00	07:00	03:00
May	19/05/2021	04:15	07:15	03:00

Table 4-1 Winter walkover survey effort

Month	Date	Start time	End time	Duration (hrs)
November	24/11/2020	09:30	15:30	06:00
December	19/12/2020	09:00	15:00	06:00
December	19/12/2020	09:00	15:00	06:00
December	20/12/2020	12:00	15:00	03:00
December	20/12/2020	12:00	15:00	03:00
January	22/01/2021	09:00	15:00	06:00
January	22/01/2021	09:00	15:00	06:00
January	29/01/2021	09:00	14:00	05:00
January	29/01/2021	09:00	14:00	05:00

Month	Date	Start time	End time	Duration (hrs)
February	22/02/2021	08:00	15:30	07:30
March	01/03/2021	09:30	15:30	06:00
March	01/03/2021	09:00	15:00	06:00
March	01/03/2021	09:00	15:00	06:00

Table 4-6 Details of flight activity survey records

Month	Date	VP	Species	Observation Time	No. of Birds	Flight Duration (Secs)	Potential Risk of Collision (PRC) (Y/N)	Flight Duration at PRC (Secs)
December	15/12/2020	3	Black grouse	08:58	3	26	Y	3
January	12/01/2021	3	Black grouse	10:50	3	7	N	0
January	23/01/2021	3	Golden eagle	11:22	1	106	N	0
January	23/01/2021	3	Golden eagle	11:19	1	48	N	0
January	30/01/2021	2	Golden eagle	12:27	1	190	Y	10
January	30/01/2021	2	Golden eagle	12:27	1	75	N	0
February	26/02/2021	1	Hen harrier	15:39	1	193	N	0
February	26/02/2021	1	Golden eagle	14:25	1	255	N	0
February	26/02/2021	1	Golden eagle	13:23	2	52	N	0
February	26/02/2021	1	Peregrine falcon	13:17	1	24	N	0
February	26/02/2021	1	Golden plover	12:54	1	175	N	0
March	15/03/2021	1	Hen harrier	13:11	1	41	N	0
March	15/03/2021	1	Hen harrier	12:26	1	18	N	0
March	15/03/2021	1	Hen harrier	11:54	1	14	N	0
March	15/03/2021	1	Hen harrier	11:49	1	80	N	0
April	23/04/2021	4	Golden eagle	15:11	1	41	Y	4
May	29/05/2021	1	Hen harrier	16:32	1	251	N	0
May	29/05/2021	1	Hen harrier	15:14	1	75	N	0
May	29/05/2021	1	Golden eagle	14:32	2	271	N	0

Month	Date	VP	Species	Observation Time	No. of Birds	Flight Duration (Secs)	Potential Risk of Collision (PRC) (Y/N)	Flight Duration at PRC (Secs)
May	29/05/2021	3	Hen harrier	12:25	1	530	Y	10
May	29/05/2021	3	Hen harrier	11:51	1	27	Y	5
June	25/06/2021	2	Hen harrier	10:29	1	60	N	0
June	29/06/2021	1	Red kite	14:25	1	120	N	0
June	29/06/2021	1	Hen harrier	11:46	1	15	N	0
July	27/07/2021	3	Hen harrier	13:52	1	75	N	0
August	16/08/2021	4	Golden eagle	16:55	1	377	Y	40

Table 4-7 Passerine species list (recorded during moorland breeding bird survey)

Species	Total Number of Individual Records
Meadow Pipit	779
Chaffinch	67
Woodpigeon	63
Skylark	56
Willow Warbler	47
Robin	36
Song Thrush	30
Hooded Crow	25
Lesser Redpoll	25
Tree Pipit	24
Mistle Thrush	20
Wren	20
Stonechat	19
Rook	17
Swallow	13
Cuckoo	12
House Sparrow	11
Coal Tit	10
Raven	10
Siskin	9
Long-tailed Tit	6
Crossbill	5
Linnet	5

Species	Total Number of Individual Records
Jay	4
Sand Martin	4
Whinchat	4
Dunnock	3
Blue Tit	2
Goldcrest	2
Goldfinch	2
Swift	2
Blackbird	1
Blackcap	1
Dipper	1